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WATER BULLETIN NUMBER 57

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**Flow of the Rio Grande  
and  
Related Data**

*From Elephant Butte Dam, New Mexico  
to the Gulf of Mexico*

**1987**

STORAGE IN MAJOR RESERVOIRS  
SOURCES OF RIVER FLOW  
DIVERSIONS  
QUALITY OF WATER  
CLIMATOLOGICAL DATA  
DRAINAGE BASIN AND IRRIGATED AREAS

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## FOREWORD

This bulletin presents the fifty-seventh compilation of the stream discharges and related data concerning the international portion of the Rio Grande, prepared jointly by the United States and Mexican Sections of the International Boundary and Water Commission. The streamflow data and kindred subjects pertain to the Rio Grande and its important tributaries near their confluence with the main stream from Elephant Butte, New Mexico to the Gulf of Mexico. The first publication in the series was Water Bulletin No. 1 for the year 1931. The present volume contains information for the year 1987.

International stream gaging on the Rio Grande was initiated in 1889, when the station at El Paso, Texas was established. Several stations on the Rio Grande and its tributaries downstream from El Paso were established in 1900 and operated until 1914. Between 1914 and 1923, except for a few months in 1919 and 1920, all stream-gaging work on the international reach of the river was suspended. In 1923 the work was resumed and carried on independently by the two countries until 1931, when the present joint program of stream measurements was adopted.

During 1987 the United States Section of the Commission operated the stream-gaging stations on the Rio Grande at El Paso, American Dam, Fort Quitman, Candelaria, Above Rio Conchos, Johnson Ranch, Foster Ranch, Del Rio, El Indio, Laredo, Rio Grande City, San Benito, and Brownsville. The Mexican Section operated the stream-gaging stations on the Rio Grande at Below Amistad Dam, Jimenez, Piedras Negras, and Below Anzalduas Dam. The station at Falcon Dam was operated jointly by the two Sections. Each Section operated the gaging stations on tributary streams, floodways, and diversions within its own country.

In 1976 the names of several gaging stations were changed, pursuant to agreement between the two Sections of the Commission. Where it was decided that some confusion might result from this change, a note giving the former name was added to the descriptive heading of the gaging station.

The total drainage area within the outer rim of the Rio Grande Basin is 335,500 square miles. However, about half of this area yields no runoff to the river, the estimated productive area of the watershed being 176,333 square miles. Reservoirs in the basin have a total storage capacity of approximately 11,816,400 acre-feet, in addition to the International Amistad and Falcon Reservoirs, which have a combined conservation capacity of 6,051,436 acre-feet. In the Rio Grande basin, a total of 1,974,810 acres is irrigated below Elephant Butte Dam on the Rio Grande and above Girvin on the Pecos River. The flow of the Rio Grande to the Gulf of Mexico below Brownsville prior to construction of Falcon Dam averaged 2,600,000 acre-feet per year for the period 1934-1952. For the period 1954-1987, this flow has averaged 816,242 acre-feet per year.

The mean sea level datum, referred to as the U. S. C. & G. S. in the description of the stream-gaging stations, is the North American Vertical Datum of 1927.

## ACKNOWLEDGMENTS

Other agencies which have contributed to some part of the data published herein include: The Agricultural Research Service and the Soil Conservation Service of the U. S. Department of Agriculture; the Bureau of Reclamation, the National Park Service, and the Geological Survey of the U. S. Department of the Interior; the National Weather Service of the U. S. Department of Commerce; the Texas Board of Health; the Texas Water Commission; the Middle Rio Grande Conservancy District; the Red Bluff Water Power Control District; State of Colorado; Division of Water Resources; the Rio Grande Compact Commission; the Delta Lake Irrigation District; the Del Rio City Water Department; the Eagle Pass City Water Department; the Laredo City Water Department; the Del Mar Conservation District; Central Power and Light Company; the El Paso Department of Water and Sewerage; the Maverick County Control and Improvement District No. 1; the Ministry of Agriculture and Hydraulic Resources of Mexico; the Meteorological Service of Mexico; Meteorological Service of the State of Chihuahua, Mexico; Federal Power Commission of Mexico; Potable Water Board of Piedras Negras, Coahuila; Federal Board of Public Improvement Works of Nuevo Laredo, Tamaulipas; and the Water and Drainage Board of Cd. Acuna, Coahuila.

Additional contributions have been made by individuals and corporations; and specific notation is made for such, as well as for those of the above-named agencies, where the data appear. The courtesy and cooperation of those who made these contributions are acknowledged with appreciation.

## PERIOD AVERAGES

In Water Bulletins Nos. 1 through 29, normal or average discharge volumes shown for the various gaging stations were based on a period beginning in 1924, or thereafter when records became available.

Beginning with Water Bulletin No. 30, the periods have been revised to include only the years following completion of major projects below which the flow of the Rio Grande or a major tributary was modified, or later when records became available. The revised periods are based on the completion of Caballo Dam in 1938, irrigation projects on the Rio Conchos and its tributaries in 1947, International Falcon Dam in 1953, and Amistad Dam and Luis L. Leon Dam in 1968.

For purposes of comparison with the average flows in the Rio Grande below Caballo Dam, records of average discharge in the Rio Grande below Elephant Butte Dam have also been revised to include the same period.

The period of record used to determine the average diversions from the Rio Grande to the United States below Falcon Dam published herein was restricted to begin in 1957, the first complete year of record after United States' waters in Falcon Reservoir were placed under the jurisdiction of the 93rd District Court of Texas.

## FOREWORD

## UNITS OF MEASURE

Data collected by the Mexican Section are computed and published in a Spanish version of the water bulletin in metric units. The Mexican data are converted and reported in this bulletin in English units. Conversion factors conform generally to those in the National Bureau of Standards Miscellaneous Publication 286 "Units of Weight and Measure (United States Customary and Metric) - Definitions and Tables of Equivalents." However, for convenience some of the factors have been shortened and modified to facilitate conversion, reconversion to the original units when necessary, and checking of data. Conversion of the mean daily discharges, the monthly average discharge, and the monthly volumes from metric to English units is direct. For this reason the monthly average discharge in cubic feet per second and monthly volumes in acre-feet shown for gaging stations operated by the Mexican Section cannot necessarily be obtained in the usual manner from total monthly flow in second-foot days. For this reason, evaporation and rainfall data, when totaled, may not be equivalent to the direct conversion from metric to English units. The following factors have been used for data in this bulletin.

METRIC UNITSENGLISH UNITSLENGTHS

1 Centimeter	0.39370	Inch
1 Meter	3.28084	Feet
1 Kilometer	0.62137	Mile

AREAS

1 Square Meter	10.76391	Square Feet
1 Hectare	2.47105	Acres
1 Square Kilometer	0.38610	Square Mile

VOLUMES

1 Cubic Meter	61023.74	Cubic Inches
1 Cubic Meter	35.31467	Cubic Feet
1 Cubic Meter	1.30795	Cubic Yards
1000 Cubic Meters	0.81071	Acre-Feet
1 Liter	0.26417	U. S. Gallon

WEIGHTS

1 Kilogram	2.20462	Pounds
1 Metric Ton	2204.623	Pounds
1 Metric Ton	1.10231	Short Tons (2,000 lbs.)

Both English and metric units are used to report the figures in the descriptive headings and for the yearly figures of the annual and period summaries of all gaging station pages. The yearly figures for the summaries are obtained by direct conversion from English to metric system of units, except for those stations operated by the Mexican Section, where the figures furnished in the metric system of units are used.

## GENERAL HYDROLOGIC CONDITIONS FOR 1987

## ALONG AND ADJACENT TO THE INTERNATIONAL PORTION OF THE RIO GRANDE

During the year 1987, temperatures were 101% of average on the watershed of the Rio Grande below El Paso, Texas. Evaporation was 87% of average. Precipitation was 103% of average from El Paso to Amistad Dam, 115% of average from Amistad Dam to Falcon Dam, 95% of average from Falcon Dam to Rio Grande City, and 103% of average in the lower Rio Grande Valley on the United States side.

The yearly volume of flow of the Rio Grande was above average from El Paso to the Confluence of the Rio Conchos with the Rio Grande and above average from the Rio Conchos Confluence to the Gulf of Mexico. In the reach between El Paso and the Confluence of the Rio Conchos, the flow was 415% of average, ranging from 505% of average at Below American Dam to 733% at Above Rio Conchos; in the reach between the Confluence of the Rio Conchos and Amistad Reservoir, where most of the flows originate from releases from Luis L. Leon Reservoir (El Granero) on the Rio Conchos, the flow was 172% of average; and in the reach between Amistad Dam and Falcon Reservoir, where flows mostly originate from releases from Amistad Reservoir, the flow was 140% of average. Most of the flows passing the Rio Grande Stations below Falcon Dam originated from releases from Falcon Reservoir, which in 1987 amounted to 1,766,208 acre-feet, or 75% of the average for the thirty-four years of operation, 1954 to 1987. The volume of flow wasted to the Gulf of Mexico was 391,553 acre-feet, which is 48% of the average for this thirty-four year period.

The total annual flow of all measured Tributaries below Fort Quitman was 109% of average. The total flow of these tributaries in the United States was 737,732 acre-feet, or 108% of average. For Mexico, the measured tributary flow, excluding Rio Alamo and Rio San Juan, was 1,698,933 acre-feet, or 132% of average. The flows of the Rio Alamo and Rio San Juan were 30% and 60% of their respective averages.

Return flow to the Rio Grande at Maverick Power Plant near Eagle Pass was 872,669 acre-feet, or 132% of the twenty-year average. Return flow to the Rio Grande through various drains in the Maverick County Irrigation District, excluding storm inflow, amounted to 35,714 acre-feet, or 31% of the twenty-year average.

There were no floods of consequence on the Rio Grande in 1987. The highest peak flows recorded on the Rio Grande were, above Falcon Dam, 24,400 second-feet at near El Indio; and, below Falcon Dam, 12,000 second-feet at Rio Grande City.

For all reservoirs in the Rio Grande basin having a capacity greater than 15,000 acre-feet, excepting Amistad and Falcon International Reservoirs, the average amount of water in storage in 1987 was 7,929,000 acre-feet, or 166% of the average 4,775,700 acre-feet. In the United States, stored water in these reservoirs was 236% of average, while in Mexico it was 128% of average.

In International Amistad Reservoir there was a net increase in storage during the year of 618,000 acre-feet. Storage ranged from a high of 3,520,600 acre-feet on December 31 to a low of 2,902,500 acre-feet on January 1 and averaged 3,253,200 acre-feet during the year, or 111% of the average for the period 1969 through 1987. In International Falcon Reservoir, there was a net increase in storage during the year of 1,048,900 acre-feet. The storage varied from a high of 2,767,000 acre-feet on December 27 to a low of 1,716,400 acre-feet on January 1 and averaged 2,378,900 acre-feet during the year, or 122% of the average for the thirty-four years of operation, 1954 through 1987.

Diversions from the Rio Grande in the United States were 109% of average. Diversions into the American Canal were 156% of average, into the Maverick Canal, 110% of average and in the United States below Falcon Dam, 94% of the average for the thirty-one years, 1957-1987. In Mexico, diversions were 93% of average. Diversions into the Acequia Madre were 134% of average, while diversions through the Anzalduas Canal for irrigation in Mexico were 91% of the thirty-four year average.

In 1987, the total reported irrigated acreage from the Rio Grande and its tributaries below El Paso, Texas showed an increase of 1% from the previous year. On the United States side, there was an increase of about 12% above Falcon Dam and a decrease of about 1% below Falcon Dam, for an overall average increase of 2%. On the Mexican side, there was no change above Falcon Dam and no change below Falcon Dam, for a nonappreciable change overall.

## 08-3610.00 RIO GRANDE BELOW ELEPHANT BUTTE DAM, NEW MEXICO

**DESCRIPTION:** Concrete wall control, bubbler gage, and water-stage recorder located on the left bank 100 feet (30.5 m) upstream from the cableway at latitude 33° 08' 45", longitude 107° 12' 20", and river mile 1,389.1 (2,235.5 km); 0.7 river mile (1.1 km) downstream from Elephant Butte Dam, 1.5 river miles (2.4 km) upstream from Cuchillo Negro River, and 135.1 river miles (217.4 km) upstream from the American Dam at El Paso, Texas. The zero of the gage is 4,242.09 feet (1,292.99 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 29 discharge measurements during the year and a continuous record of gage heights. Records were furnished by the United States Geological Survey. Records available: 1915 through 1987.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. Beginning December 1940, hydroelectric power generation facilities for 27,000 kva were placed in operation at Elephant Butte Dam.

**EXTREME FLOWS FROM RECORDS:**

Average Flow in Second-Feet (Cubic Meters per Second)						
Daily:	Max. 8,220 (233)	May 22, 1942	Min. 0			Occasionally
Monthly:	Max. 7,600 (215)	May 1942	Min. 1.2 (0.03)			Nov. 1971
Yearly:	Max. 2,510 (71.1)	1942	Min. 253 (7.16)			1964

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,090	2,120	2,110	2,120	2,850	4,450	2,120	2,140	1,490	132	41.0	* 89.0
2	2,090	2,110	2,110	2,100	2,640	4,550	2,100	2,140	1,510	58.0	41.0	* 89.0
3	2,090	2,090	2,100	2,100	2,620	4,620	2,090	2,150	1,520	67.0	41.0	91.0
4	2,090	2,090	2,110	2,100	2,610	4,610	2,090	2,120	1,320	65.0	41.0	92.0
5	1,630	2,100	2,110	2,110	2,550	4,130	2,100	2,100	777	65.0	41.0	97.0
6	1,370 *	2,100	2,120	2,110	2,480	3,640	3,300	2,090	793	64.0	42.0	99.0
7	1,370 *	2,110	2,120	2,300	2,560	3,560	4,070	2,070	800	* 55.0	42.0	100
8	1,360	2,100	2,120	2,390	2,940	3,420	4,140	2,060	810	47.0	41.0	101
9	1,360	2,100	2,130	2,390	3,210	3,090 *	4,130	2,080	819	47.0	41.0	101
10	1,380	2,100	2,100	2,350	3,190	2,090	4,270	2,080	813	* 46.0	41.0	104 *
11	1,370	2,100	2,140	2,290	3,150	2,090	4,430	2,060	820	46.0	41.0	106
12	1,730	2,120	2,140	2,350	2,290	2,090	4,420	2,050	820	45.0	41.0	106
13	2,110	2,110	2,130	2,280	3,510	2,090	4,420	2,060	819	44.0	41.0	107
14	2,120	2,110	2,130	2,180	3,530	2,090	4,400	807	807	43.0	42.0	108
15	2,120	2,110	2,120	3,540	2,090	4,380	1,430	792	*	43.0	42.0	109
16	2,120	2,110	2,130	2,110	3,530	2,550	4,350	1,440	783	* 43.0	* 44.0	108
17	2,130	2,110	2,140	2,110	3,490	2,990	4,350	1,430	772	43.0	47.0	110
18	2,120	2,120	2,160	2,110	3,480	2,990	4,330	1,430	774	43.0	52.0	111 *
19	2,120	2,110	2,170	2,100	3,560	3,260	4,330	1,740	767	43.0	54.0	112
20	2,130	2,110	2,170	2,090	3,620	3,450	4,350	2,070	757	* 43.0	57.0	113
21	2,120	2,110	2,170	2,780	3,620	3,440	4,190	2,080	749	43.0	60.0	114
22	2,120	2,110	2,180	3,120	3,640	3,430	3,840	2,080	736	42.0	64.0	114
23	2,130	2,110	2,190	3,070	3,670	3,430	3,960	2,100	913	42.0	66.0	118
24	2,130	2,110	2,130	3,060	3,680	3,250	3,340	2,100	782	41.0	71.0	119
25	2,130	2,100	2,190	3,040	3,660	3,120	2,730	2,100	781	41.0	73.0	124
26	2,110	2,100	2,190	3,030	3,640	3,110	2,760	2,100	781	41.0	76.0	125
27	2,120	2,050	2,880	3,010	3,640	3,110	2,770	1,680	780	41.0	79.0	125
28	2,120	2,120	3,220	3,010	3,670	3,110	2,480	1,470	781	40.0	82.0	125
29	2,120	2,120	3,180	3,030	4,050	2,570	2,150	1,480	780	40.0	84.0	125
30	2,120	2,120	2,790	3,010	4,340	2,120	2,160	1,480	778	* 41.0	87.0	125
31	2,130	2,120	2,120	4,350			2,150	1,480		41.0		124 *
<b>Sum</b>	58,940	73,910	94,640	58,330	1,545.0	3,391.0						
	60,250	69,800	104,380	106,700	26,424	1,615.0						

**Current Year 1987**

Month	Extreme Gage Feet			Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low	Day			Average	Maximum	Minimum
Jan.			17	2,130	1 8	1,360	1,940	119,504	26,700	119,504	200
Feb.			1	2,120	27	2,050	2,110	116,906	42,113	116,059	188
Mar.			28	3,220	3	2,100	2,250	138,446	67,880	138,446	1,022
Apr.			22	3,120	20	2,090	2,460	116,598	82,003	162,000	11,207
May			31	4,350	6	2,480	3,270	207,035	89,760	467,000	512
June			3	4,620	110	2,090	3,150	187,716	96,921	363,000	16,913
July			11	4,430	1 3	2,090	3,440	211,636	96,923	211,636	41,352
Aug.			3	2,150	115	1,430	1,880	115,696	75,778	140,668	9,530
Sept.			3	1,520	22	736	881	52,411	33,757	129,000	163
Oct.			1	132	128	80.0	49.8	3,064	16,483	125,443	148
Nov.			30	87.0	1 1	41.0	53.8	3,203	16,307	158,000	74.2
Dec.			126	125	1 1	89.0	109	6,726	21,750	129,759	138
<b>Yearly</b>				4,620		40.0	1,810	1,308,941	666,375	1,818,800	183,415
				Meters	Cubic Meters per Second				Thousands of Cubic Meters		
					131	1.13	51.3	1,614,553	821,960	2,243,453	226,239

\* Discharge measurement made on this day

0 Mean daily

! And other days

## 08-3625.00 RIO GRANDE BELOW CABALLO DAM, NEW MEXICO

**DESCRIPTION:** Cableway, gravity well, and water-stage recorder located on the left bank at latitude 32°53'05", longitude 107°17'30", and river mile 1,360.8 (2,190.0); 0.8 river mile (1.3 km) downstream from Caballo Dam, about 3 miles (5 km) northeast of Arrey, New Mexico, 5 miles (8.0 km) south of Caballo, New Mexico, and 106.8 river miles (171.9 km) upstream from the American Dam at El Paso, Texas. The zero of the gage is 4,140.90 feet (1,262.15 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 58 discharge measurements during the year and a continuous record of gage heights. Records were furnished by the El Paso office of the United States Bureau of Reclamation. Records available: 1938 through 1987.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. In addition to the outflow from Caballo Dam listed below, 206 acre-feet (254,000 m³) of water were diverted in 1987 into Bonita Lateral, a small irrigation canal just below Caballo Dam. Prior to 1938, discharge records were kept at Percha Dam, a low diversion dam about 1.5 miles (2.4 km) downstream from this station. Small accretions to the river take place between the station and Percha Dam.

**EXTREME FLOWS FROM RECORDS:**

Average Flow in Second-Feet (Cubic Meters per Second)										
Daily:	Max.	7,650 (217)	May	20, 1942	Min.	0.1 (0.003)	Several days	1954,		
								1955 and 1972		
Monthly:	Max.	6,710 (190)	May	1942	Min.	0.1 (0.003)	Nov. & Dec.	1955		
Yearly:	Max.	2,480 (70.2)	May	1942	Min.	284 (8.04)			1964	

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,620	1,920	2,010	2,450	2,760	3,740	3,950	2,420 *	1,100	1,060	77.0	74.0
2	2,630	1,920	2,000	2,460	2,430 *	3,770	3,950	2,410	1,150 *	964	77.0	74.0
3	2,640	1,920	2,030	2,490	2,430	3,850 *	4,030	2,400	1,150	904	77.0	74.0
4	2,640	1,930	2,050	2,490 *	2,430	3,980	4,100	2,370	1,090	905	77.0	74.0
5	2,600	1,940	2,050	2,510	2,310	3,850	4,100	2,350 *	934 *	901	76.0	74.0
6	2,620 *	1,960	2,260	2,520	2,220 *	3,690	4,100	2,350	1,000	806	75.0	74.0
7	2,610 *	2,000	2,440 *	2,530	2,490	3,710	4,060	2,290	1,030	806 *	74.0	73.0
8	2,610	2,000	2,460	2,530	3,030	3,760	4,190 *	2,240	1,000	804	73.0	71.0
9	2,170	2,000	2,470	2,540	3,280 *	3,020 *	4,340	2,240	971 *	1,040	70.0	72.0
10	2,070	2,190	2,620	2,450	3,280	1,040 *	4,500	2,240	950	1,350 *	71.0	72.0
11	2,070	2,320 *	2,710 *	2,380 *	3,280	1,350	4,650	2,010	1,430 *	1,350	70.0	72.0
12	2,050	2,300 *	2,710	2,400	3,450	1,590	4,640	1,790 *	1,530	661	70.0	72.0
13	2,060 *	2,150	2,910	2,410	3,600 *	1,650	4,570	1,560	1,530	583 *	70.0	72.0
14	1,710	2,000	3,060 *	2,010	3,600	1,650	4,410	1,780	1,310	100	70.0	71.0
15	1,430	1,990	3,090	2,030 *	3,600	1,650	4,450 *	1,920 *	1,100	90.0	70.0	73.0
16	1,430	2,000	3,110	2,030	3,600	1,880	4,580 *	1,930	1,010 *	80.0	71.0	73.0
17	1,430	2,000	3,100	2,080	3,600	2,100 *	4,310 *	1,930	1,010	80.0	71.0	72.0
18	1,430	2,000 *	3,240	2,120 *	3,600	2,230	4,360	2,180	959	80.0	71.0	72.0
19	1,430	1,990	3,340 *	2,120	3,780	2,330	4,370	2,240 *	884	80.0	71.0	72.0
20	1,430	1,980	3,320	2,120	4,130 *	2,450 *	4,240	2,240	862 *	80.0	72.0	71.0
21	1,440	1,980	3,310	2,690	4,180	2,450	3,850	2,180	862	80.0	72.0	71.0
22	1,440 *	1,990	3,310	3,110	3,980	2,440	3,440	2,140 *	935	80.0	72.0	73.0
23	1,450	2,000	2,880	3,100	3,760 *	2,470	3,480 *	2,080	990 *	80.0	72.0	73.0
24	1,450	2,000	2,490	3,100	3,740	2,880	3,570	1,430	1,000	80.0	72.0	72.0
25	1,450	1,990	2,250 *	3,100	3,720 *	3,650	3,050 *	981	939	80.0	73.0	71.0
26	1,450	2,000	2,290	3,100	3,710	4,220	2,910	624	883	79.0	73.0	71.0
27	1,800	2,010	2,420	3,100	3,710	4,540 *	2,900	572 *	887	78.0	73.0	71.0
28	1,920	2,010	2,530 *	3,060	3,700	4,510	2,900	577	865	77.0	73.0	71.0
29	1,920 *		2,550	3,070	3,700	4,460	2,870	591	1,080	77.0	74.0	71.0
30	1,920		2,570	3,090 *	3,720 *	4,210	2,370	595	1,060 *	77.0	74.0	71.0
31	1,920		2,510	3,730			2,390	719		77.0		70.0
<b>Sum</b>	56,490	77,190	89,120	104,550	119,630	55,479	13,589.0	31,501	2,181.0	2,237.0		
	59,840	82,090										

**Current Year 1987****Period 1938-1987**

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Low		Average	Maximum	Minimum		
Jan.			! 3	2,640	! 15	1,430	1,930	118,691	4,196	118,691	19.2
Feb.			11	2,320	! 1	1,920	2,020	112,046	11,820	112,046	11.7
Mar.			19	3,340	2	2,000	2,650	162,823	85,908	162,823	24,900
Apr.			22	3,110	14	2,010	2,570	153,104	80,624	212,000	25,470
May			21	4,180	6	2,220	3,370	207,372	79,184	412,000	75.2
June			27	4,540	10	1,040	2,970	176,767	105,445	354,000	25,299
July			11	4,650	30	2,370	3,860	237,283	113,775	237,283	28,200
Aug.			1	2,420	27	572	1,790	110,081	104,162	179,000	20,500
Sept.			12	1,530	120	862	1,050	62,481	50,101	181,000	6,757
Oct.			10	1,350	! 28	77.0	438	26,953	6,855	122,717	15.5
Nov.			! 1	77.0	! 9	70.0	72.7	4,326	3,579	82,403	7.0
Dec.			! 1	74.0	31	70.0	72.2	4,437	4,921	146,380	6.0
<b>Yearly</b>				4,650		70.0	1,900	1,376,324	650,575	1,795,670	206,085
	<b>Meters</b>		<b>Cubic Meters per Second</b>		<b>Thousands of Cubic Meters</b>						
				132		1.98	53.8	1,697,668	802,471	2,214,923	254,085

\* Discharge measurement made on this day

Ø Mean daily

! And other days

## 08-3640.00 RIO GRANDE AT EL PASO, TEXAS

**DESCRIPTION:** Gravity well and water-stage recorder located on the downstream side of the first pier from the left abutment of the Courchesne Bridge at latitude  $31^{\circ}48'10''$ , longitude  $106^{\circ}32'25''$ , and river mile 1,255.7 (2,020.8 km); 5.5 river miles (8.9 km) upstream from the Paso del Norte Bridge between El Paso, Texas and Cd. Juarez, Chihuahua and 1.7 miles (2.7 km) upstream from the American Dam at El Paso, Texas. The zero of the gage is 3,722.30 feet (1,134.56 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Mean daily discharges in 1987 were computed by adding the flows in the American Canal and the flows at the river station below the American Dam. Because the mean daily discharges are rounded, the monthly sum for this station may not equal the sum of the monthly sums of the other two stations. Extreme discharges are those passing the El Paso station.

In 1987, 23 discharge measurements were made at this station. Records available: 1889 through 1987.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 24,000 second-feet (680 m<sup>3</sup>/sec) on June 12, 1905. Min. occasionally no flow. Since Elephant Butte Dam was closed in 1915, the largest peak flow to pass this station was 13,500 second-feet (382 m<sup>3</sup>/sec) on September 3, 1925.

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 23,680 (671)	June 12, 1905	Min. 0	Occasionally
Monthly:	Max. 14,300 (405)	June 1905	Min. 0	Occasionally
Yearly:	Max. 2,780 (78.7)	1905	Min. 70.1 (1.99)	1902

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,370	2,000 *	1,720	1,510	2,460	2,910	3,040	1,450	903	622	337	210
2	2,460 *	1,980	1,790	1,440	2,280	2,840	2,790	1,570	891	626	352	210
3	2,480	1,910	1,660	1,580	1,960	2,720 *	2,700	1,570	890	521	332	204
4	2,530	1,820	1,490	1,630	1,990 *	2,850	2,710	1,420	902	590	293	203
5	2,610	1,750	1,430	1,820	1,830	2,970	2,900	1,400	919	611	274	198
6	2,650	1,820	1,420	1,850	1,810	2,810	2,990	1,370	1,020	474 *	276	183
7	2,830	1,820	1,480	1,850 *	1,810	2,900	2,730	1,380	1,040	432	273	179
8	2,830	1,930	1,850	1,740	1,860	3,560	2,540	1,360	867 *	469	269	178
9	2,810	1,860	1,900	1,720	2,270	3,520	2,580	1,420	792	420	269	175
10	2,420	1,730	1,780 *	1,750	2,620	2,740	2,760	1,450	712	445	260	173
11	2,160	1,750	1,870	1,780	2,850	1,710	2,780	1,390 *	591	448	243	168
12	2,160	1,850	2,080	1,690	2,680	1,270	3,050	1,270	633	629	256 *	164
13	2,150	1,900	2,020	1,850	2,750	1,260	3,090	1,180	744	625	264	179
14	2,180 *	1,910	2,050	1,760	2,570	1,180	3,190 *	1,290	1,040	750	270	182
15	2,000	1,800	2,300	1,660	2,870	1,280	3,000	1,050	1,160	585	260	172
16	1,520	1,750	2,360	1,350	2,780	1,190	2,860	903	1,100	535	258	155
17	1,540	1,640	2,220	1,410	2,910	1,010 *	3,260	972	901	508	258	152
18	1,430	1,550	1,940	1,550	3,070	1,010	2,810	875	860	494	270	180
19	1,320	1,550	1,980	1,740	2,980 *	1,110	2,910	791	826	461	268	186
20	1,300	1,560	2,230	1,860	2,840	1,110	3,000	865	833	438	260	181
21	1,370	1,780	2,140	1,630 *	3,060	1,160	2,880	910	822	410	250	180
22	1,450	2,040	2,230	1,800	3,130	1,200	2,700	979	698 *	405	243	191
23	1,480	1,750	2,450	2,010	2,930	1,400	2,120	1,020	632	398	236	182
24	1,500	1,670 *	2,050 *	2,060	2,780	1,370	2,160	3,490 *	626	393	246	180
25	1,470	1,640	1,620	2,380	2,850	1,300	2,140	2,700	661	388	246	183
26	1,460	1,720	1,300	2,480	2,860	1,710	1,910	1,510	643	373	233	185
27	1,450 *	1,760	1,400	2,620	2,700	1,750	1,310	679	358 *	229	192	
28	1,610	1,750	1,370	2,840	2,680	3,900	1,740 *	1,190	637	354	228	197
29	1,910		1,680	2,650	2,720	3,350	1,700	1,080	643	348	221	189
30	1,920		1,890	2,470	2,680	3,170 *	1,740	987	541	338	212	187
31	1,960		1,700		2,770		1,640	908	335			182
<b>Sum</b>	49,990	56,480	63,240		41,060		14,783		5,680			
	61,330	57,400	80,350		80,170		24,206		7,886			

## Current Year 1987

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day			Average	Maximum	Minimum	
Jan.	6.12	5.15	1 7	2,830	20	1,300	1,980	121,646	8,762	121,646	
Feb.	5.95	5.26	22	2,040	18	1,550	1,790	99,154	9,939	115,154	
Mar.	6.20	4.97	23	2,450	26	1,300	1,850	113,851	35,989	113,851	
Apr.	6.33	5.30	28	2,840	16	1,350	1,880	112,026	41,726	139,000	
May	6.82	5.19	22	3,130	1 6	1,810	2,590	159,372	45,787	357,000	
June	7.18	5.04	28	3,900	117	1,010	2,110	125,435	53,340	304,000	
July	6.75	5.44	17	3,260	31	1,640	2,590	159,015	60,817	198,000	
Aug.	7.92	5.23	24	3,490	19	791	1,320	81,441	57,153	158,000	
Sept.	5.65	4.06	15	1,160	30	541	807	48,012	38,576	171,000	
Oct.	5.05	3.70	14	750	31	335	477	29,322	16,691	132,722	
Nov.	3.94	3.10	2	352	30	212	263	15,642	10,145	100,899	
Dec.	3.10	2.78	1	210	17	152	183	11,266	10,715	159,987	
Yearly	7.92	2.78		3,900		152	1,490	1,076,182	389,640	1,559,200	57,481
	Meters			Cubic Meters per Second			Thousands of Cubic Meters				
	2.41	0.85		110		4.30	42.2	1,327,449	480,613	1,923,242	70,902

\* Discharge measurement made on this day

0 Mean daily

! And other days

08-3645.00 DIVERSIONS FROM THE RIO GRANDE  
AMERICAN CANAL AT EL PASO, TEXAS

**DESCRIPTION:** Concrete control consisting of two triangular-shaped wingwalls extending toward the center of the canal about one-fourth of the canal width and downstream at a 30° angle with the canal side walls, bubbler gage, water-stage recorders (graphic and digital), and binary decimal transmitter located on the right bank of the concrete-lined canal at El Paso, Texas, latitude 31°46'40", longitude 106°31'35", and about 2,400 feet (700 m) downstream from the headgates of the American Dam, which are located at river mile 1,254.0 (2,018.0 km). The zero of the gage is 3,712.09 feet (1,131.45 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 15 discharge measurements during the year, a stable rating curve at medium and high flows, and a continuous record of gage heights. Records available: June 2, 1938 through 1987.

**REMARKS:** This canal diverts water from the Rio Grande at the American Dam at El Paso, Texas, 2.1 river miles (3.4 km) upstream from the International Dam at Cd. Juarez, Chihuahua. Water from this canal discharges into the Franklin Canal from which water is frequently returned to the Rio Grande at spillways 2.2 (3.5), 2.7 (4.3), and 3.6 (5.8) river miles (km) downstream from the American Dam. The transmitter relays gage height data upon interrogation by telephone via commercial circuits.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 1,840 second-feet (52.1 m<sup>3</sup>/sec) on March 27, 1944. Min. frequently no flow. Average Flow in Second-Feet (Cubic Meters per Second)

Daily: Max. 1,510 (42.8)	Aug. 13, 1945	Min. 0	Frequently
Monthly: Max. 1,210 (34.3)	Aug. 1943	Min. 0	Frequently since 1952
Yearly: Max. 748 (21.2)	1943	Min. 65.6 (1.86)	1956

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	777	1,020	821	719 *	882 ■	502	1,060	422	640 *	387 ■	325	0
2	776	1,020	863 ■	712	834	515	1,010 ■	507	656	411	340	0
3	770	1,030	785	795	821	530	997	506	650	335	321 ■	0
4	778	952 *	689	798	876	683 ■	1,020	450	650	419	147	0
5	800	915	694	866	767	808	1,020	443 *	656	531	0	0
6	710	967	687	857	712	838	979	405	741	438	0	0
7	416 *	967	725	856	734	902	904	436 ■	751	401	0	0
8	327	1,020	930	796	776	992	879	484	586	441	0	0
9	328	982	945	798	692	1,040 ■	879	522	509	395	0	0
10	321	901	878	773	757	998	909	546	431	422	0	0
11	316	905	918	829	919	736	882	513	309	427	0	0
12	358	944	969	752	884	747	862	425	349	610	0	0
13	442	984	950	832	910	909	893	384	446	608	0	0
14	444	975	980	788	567	855	900	474	707	734	0	0
15	431	933	995	727	893	951	878	378	807	571	0	0
16	391	922	983	512	880	886	873	577	766	521	0	0
17	405	867 ■	975	565	884	734	861	584	595	494	0	0
18	398	803	965	655	901	746	768	518	544	481	0	0
19	395	764	969	840	875	827	786	450	519	448	0	0
20	603	774	910	880	847	838	801	497	529	426	0	0
21	875	895	754	724	875	844	780	527	521	397	0	0
22	928	954	781	819	846	845	738	538	401	392	0	0
23	965	833	771	924	810	991	653	534	349	385	0	0
24	984	799	750	892	819	997	689	703	348	380	0	0
25	975	789	567	898	829	931	686	617	396	375	0	0
26	980	834	345	921	832	980	616	417	390	360	0	0
27	997	859	469	937	514	952	560	263	426	345	0	0
28	1,000	837	544	940	485	989	530	520	392	340	0	0
29	994		731	911	475	1,010	543	612	415	335	0	0
30	1,010		786	903	472	1,080	570	567	313	325	0	0
31	1,050		739		488		506	524		322		
<b>Sum</b>	<b>25,445</b>		<b>24,219</b>		<b>25,656</b>		<b>15,343</b>		<b>13,456</b>		<b>0</b>	
	20,944		24,868		23,856		25,032		15,792		1,133	

**Current Year 1987**

**Period 1939-1987**

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day			Average	Maximum	Minimum
Jan.	9.40	5.81	31	1,080	111	311	41,542	3,706	41,542	0
Feb.	9.31	7.43	1	1,070	19	603	50,469	6,596	50,755	0
Mar.	9.33	5.01	15	1,030	25	214	802	49,325	30,797	50,100
Apr.	9.05	6.67	29	993	16	477	807	48,038	29,597	70,900
May	9.24	5.98	18	931	30	465	770	47,318	27,666	69,000
June	9.78	6.68	129	1,160	11	454	855	50,888	35,830	5,990
July	9.85	7.67	2	1,180	31	422	807	49,650	42,480	70,700
Aug.	10.51	6.34	24	955	28	194	495	30,432	41,671	8,673
Sep.	8.77	5.27	15	861	30	230	526	31,323	28,398	4,840
Oct.	8.60	5.27	14	840	1	230	434	26,690	12,907	2,230
Nov.	6.41	5.63	1	397	4	0	37.8	2,247	7,034	0
Dec.	2.15	2.15	1	0	1	0	0	0	6,945	44,680
	10.51	2.15		1,180		0	591	427,922	273,627	541,610
<b>Yearly</b>	<b>Meters</b>			<b>Cubic Meters per Second</b>		<b>Thousands of Cubic Meters</b>				
	3.20	0.66		33.4		0	16.7	527,833	337,513	668,065
	■ Discharge measurement made on this day			! And other days						58,463

08-3650.00 RIO GRANDE BELOW AMERICAN DAM AT EL PASO, TEXAS  
AND CD. JUAREZ, CHIHUAHUA, MEXICO

**DESCRIPTION:** Cableway, gravity well, and water-stage recorders (graphic and digital) located on the left bank of the river at latitude 31°46'35", longitude 106°31'20", and river mile 1,253.4 (2,017.1 km); 1.5 river miles (2.4 km) upstream from the International Dam, 3.1 river miles (5.0 km) upstream from the Paso del Norte Bridge between El Paso, Texas and Cd. Juarez, Chihuahua, and 0.6 river mile (1.0 km) downstream from the American Dam. The zero of the gage is 3,712.30 feet (1,131.51 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 51 discharge measurements during the year, and a continuous record of gage heights. Computations by shifting control methods. Records available: June 1938 through 1987. During 1985 and 1986 for flows to be delivered to Mexico during the irrigation season, the flow record was based on a continuous record of gage heights at this station and a rating curve developed from discharge measurements at a site 1.1 river miles downstream from above gaging station.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. The operation of the American Dam began June 2, 1938. Part of the flow above the dam is diverted into the American Canal, and the remainder, including excess flood flows, passes below the dam.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 11,300 second-feet (320 m<sup>3</sup>/sec) on September 14, 1958 with a gage height of 14.50 feet (4.42 m). Min. occasionally no flow.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 6,040 (171)	May 20, 1942	Min. 0	Occasionally
Monthly:	Max. 4,880 (138)	May 1942	Min. 0	Occasionally
Yearly:	Max. 1,510 (42.8)	1942	Min. 13.8 (0.39)	1956

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,590	976	898	793	1,580 *	2,410	1,980 *	1,030	263 *	235 *	12.3	210
2	1,680	960	924	730 *	1,450	2,330	1,780	1,060	235	215	12.1	210
3	1,710	883	870	787	1,140	2,190	1,700	1,050	240	186	*11.5	204 *
4	1,750	870	798 *	830	1,110	2,170	1,690	968	252	171	146	203
5	1,810	834 *	736 *	954	1,060	2,160	1,880	961 *	263	80.1	274	198
6	1,940 *	855	728	989	1,100	1,970	2,010	961	281	35.5	276	183
7	2,410	852	757	993 *	1,080	2,000	1,830	945	294	30.6	273	179
8	2,500	906	922	939	1,080	2,570 *	1,660	878	281	28.4	269	178
9	2,480 *	883	956	925	1,580	2,480	1,700	898	283	24.9	269 *	175
10	2,100	832	899	975	1,860	1,740	1,850 *	903	281	23.3	260	173
11	1,840	842	953 *	950	1,930	975	1,900	873	282 *	21.1	243	168
12	1,800	902 *	1,110 *	941	1,800	520	2,190	843	284	18.9	256	164
13	1,710	914	1,070	1,020	1,840	347	2,200	795 *	298	*16.8	264	179
14	1,740	934	1,070	968	2,000	327	2,290	820	328	15.6	270	182
15	1,570 *	869	1,300	931 *	1,980	330	2,120	675	354	14.2	260	172 *
16	1,130	829	1,380	841	1,900	305	1,990	326	335 *	*13.8	258	155
17	1,130	768	1,250 *	843	2,030	2,400	3,400	388	306	13.6	258	152
18	1,030	747	980	893	2,170	260 *	2,040	357	316 *	13.2	270	180
19	927	783 *	1,010	902	2,110	284	2,120	341 *	307	13.2	268 *	186
20	692	782	1,320	980	1,990 *	299	2,200	368	304	12.4	260	181
21	499	886	1,390	909	2,190	319	2,100	383 *	301	*12.5	250	180
22	525 *	1,090	1,450	986 *	2,280	351	1,960	441	297	12.9	243	191
23	515	919	1,680	1,090	2,120	406	1,470 *	487	283	13.2	236	182
24	515	872	1,300	1,170	1,950	377	1,470	2,790	278	13.3	246	180
25	491	856	1,050	1,980	2,020	370 *	1,450	2,080	265 *	13.3	246	183
26	484	885 *	954 *	1,560	2,030	734	1,290	1,090 *	253	13.3	233	185
27	455 *	903	1,680	986 *	2,190	1,750	1,190	1,050	253	12.8	229	192
28	613	909	822	1,900	2,200	2,910	1,210	672	245	13.9	228	197
29	920 *	950	1,740	2,240	2,340	1,160	473	228	13.1	221	189	
30	905	1,100	1,570	2,210	2,090	1,170 *	420	228	*13.3	212	187	
31	914	952	2,280				1,130	384		13.1		182
<b>Sum</b>	24,541	32,269	37,587		25,720			1,327.3		5,680		
	40,375	32,524	56,510	55,130	8,418			6,753.9				

**Current Year 1987**

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	Day			Average	Maximum	Minimum
Jan.	9.56	6.30	8	2,620	22	273	1,300	80,083	5,016
Feb.	8.21	7.33	22	1,210	18	697	876	48,676	48,676
Mar.	9.07	5.96	23	1,900	4	571	1,050	64,510	5,031
Apr.	9.59	7.12	28	2,350	23	616	1,080	64,005	11,633
May	9.65	7.58	27	2,570	5	1,010	1,820	112,086	17,611
June	10.86	6.20	28	3,870	18	255	1,250	74,553	250,000
July	9.70	7.59	17	2,650	31	956	1,780	109,349	17,976
Aug.	12.91	6.07	24	6,890	16	232	830	51,015	155,000
Sept.	6.58	6.07	16	382	1	210	281	16,697	17,976
Oct.	6.19	4.96	1	252	20	11.8	42.8	2,633	3,669
Nov.	6.40	5.00	6	286	4	10.9	225	13,396	84,865
Dec.	6.33	6.03	1	215	17	139	183	11,266	115,279
	12.91	4.96		6,890		10.9	895	646,269	128,421
<b>Yearly</b>	<b>Meters</b>		<b>Cubic Meters per Second</b>		<b>Thousands of Cubic Meters</b>				
	3.93	1.51		195		0.31	25.3	799,627	158,405
								1,348,876	12,336

\* Discharge measurement made on this day      ! And other days

## 08-3655.00 DIVERSIONS FROM THE RIO GRANDE

ACEQUIA MADRE AT CD. JUAREZ, CHIHUAHUA

**DESCRIPTION:** Bridge for making discharge measurements, gravity well, and water-stage recorder located on the right bank of the canal at Cd. Juarez, Chihuahua, latitude 31° 45' 40", longitude 106° 30' 30", about 260 feet (80 m) downstream from the canal intake at the International Dam at Cd. Juarez, Chihuahua, which is located at river mile 1,251.8 (2,014.7 km) and 2.1 river miles (3.4 km) downstream from the American Dam at El Paso, Texas.

**RECORDS:** Flow records provided by Mexican Section. Records available: 1938 through 1987. These records, showing the water diverted by Mexico, do not necessarily reflect the quantities of water made available to Mexico in the bed of the river by the United States under the terms of the Convention of 1906. Such quantities of water are included in the record of "Rio Grande below American Dam at El Paso, Texas." See page 11 in this Water Bulletin.

**REMARKS:** In 1987 all of the 65,866 acre-feet (81,243,000 m<sup>3</sup>) tabulated below were distributed to land irrigated in the first unit under the canal.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 480 second-feet (13.6 m<sup>3</sup>/sec) on July 21, 1944 with a gage height of 6.00 feet (1.83 m). Min. no flow during several months throughout the year.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 339 (9.61)	May 10, 1942	Min. 0	Several months each year
Monthly:	Max. 283 (8.00)	May 1938	Min. 0	Several months each year
Yearly:	Max. 116 (3.28)	1942	Min. 9.2 (0.26)	1964

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	157	146	182	166	164	150	153	0	0
2	0	0	23.0	162	144	180	164	157	160	159	0	0
3	0	0	71.7	164	137	175	166	164	157	164	0	0
4	0	0	60.4	163	138	176	185	167	158	159	0	0
5	0	0	60.4	167	144	172	195	173	159	78.4	0	0
6	0	0	60.7	172	145	172	191	171	158	0	0	0
7	0	0	55.1	165	143	174	183	163	161	0	0	0
8	0	0	62.0	158	140	185	182	162	155	0	0	0
9	0	0	99.6	157	151	183	185	169	152	0	0	0
10	0	0	150	159	166	170	185	160	150	0	0	0
11	0	0	150	157	162	170	187	162	151	0	0	0
12	0	0	154	152	151	174	191	173	0	0	0	0
13	0	0	151	157	153	177	188	170	154	0	0	0
14	0	0	156	153	161	175	188	172	150	0	0	0
15	0	0	162	148	161	165	182	168	154	0	0	0
16	0	0	160	139	153	177	176	150	156	0	0	0
17	0	0	145	148	160	184	185	153	148	0	0	0
18	0	0	112	151	135	185	177	160	154	0	0	0
19	0	0	167	154	60.4	184	173	165	158	0	0	0
20	0	0	172	155	0	190	175	168	156	0	0	0
21	0	0	163	154	0	165	172	173	157	0	0	0
22	0	0	168	153	0	184	171	171	150	0	0	0
23	0	0	170	158	0	186	167	167	149	0	0	0
24	0	0	158	146	0	178	170	130	149	0	0	0
25	0	0	153	146	0	178	165	111	150	0	0	0
26	0	0	164	148	0	183	162	159	150	0	0	0
27	0	0	170	152	75.2	182	166	169	150	0	0	0
28	0	0	166	153	121	172	174	162	154	0	0	0
29	0	0	175	150	136	176	168	148	155	0	0	0
30	0	0	179	152	147	174	187	152	154	0	0	0
31	0	0	171	153	153	186	186	153	0	0	0	0
<b>Sum</b>	0	0	4,660	5,328	4,996	713.4	0	0	0	0	0	0
			4,009.1	3,382.6	5,512	4,614						

## Current Year 1987

Period 1938-1987

Month	Average Rainfall Inches**		Extreme Second-Feet		Average Second- Feet	Total Acre-Feet	Acre-Feet		
	1938-1987	1987	High	Low			Average	Maximum	Minimum
Jan.	.43	.28	0	0	0	0	40.6	2,030	0
Feb.	.43	.24	0	0	0	0	150	7,510	0
Mar.	.35	.43	20	189	1.1	129	7,951	7,951	0
Apr.	.28	.31	23	183	16	128	9,240	8,278	12,383
May	.35	.28	27	190	120	0	6,709	8,827	2,020
June	.67	1.34	28	225	15	101	10,568	8,572	17,380
July	1.54	.55	5	202	1	145	178	8,772	15,700
Aug.	1.61	4.06	24	198	25	61.8	161	9,562	15,170
Sept.	1.42	.71	166	168	139	154	9,149	4,481	12,620
Oct.	1.06	.16	166	! 6	0	23.0	1,413	58.9	1,413
Nov.	.47	.39	0	0	0	0	0	0	0
Dec.	.59	2.68	0	0	0	0	0	0	0
	9.20	11.43	225	0	91.1	65,866	49,310	83,930	6,653
<b>Yearly</b>			Cubic Meters per Second		Thousands of Cubic Meters				
	Millimeters	290	6.37	0	2.58	81,243	60,828	103,511	8,207

\* Discharge measurement made on this day

! And other days

\*\* Average for valley floor in United States and Mexico from El Paso to Clint station

08-3705.00 RIO GRANDE AT FORT QUITMAN, TEXAS  
NEAR COLONIA LUIS LEON, CHIHUAHUA

**DESCRIPTION:** Cableway, gravity well, and digital water-stage recorder located on the left bank of the rectified channel of the Rio Grande at latitude 31°05'10", longitude 105°36'30", and river mile 1,173.2 (1,888.1 km); 1.5 river miles (2.4 km) downstream from Old Fort Quitman, 9 miles (14.5 km) southeast of Esperanza, Texas, and 17.5 miles (28.2 km) southeast of McNary, Texas. The zero of the gage is 3,450.57 feet (1,051.73 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 49 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1889 through 1987.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. During the period of January through August, flows up to an estimated 900 of bypassed this station on the landside of the Mexican levee. These flows escaped from the river through several gaps in the levee. These flows are not included in the data published below.

**EXTREME FLOWS FROM RECORDS\*\*:** Momentary: Max. 10,600 second-feet (300 m<sup>3</sup>/sec) October 5, 1946 with a gage height of 10.00 feet (3.05 m). Min. frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily: Max. 5,890 (167)	May 19, 1942	Min. 0	Frequently
Monthly: Max. 5,030 (142)	May 1942	Min. 0	Several months since 1951
Yearly: Max. 1,750 (4.96)	1942	Min. 2.3 (0.07)	1965

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,890	1,020	1,010	1,020 *	1,350	1,180	1,300 *	714	327 *	145 *	500	399
2	1,910	1,060	1,020	1,040	1,290	1,180	1,190	604	323	129	471	409 *
3	1,940	1,100 *	1,030 *	1,050	1,220	1,210	1,150	533	224	132	472	378
4	1,990	1,120	971	1,090	1,130	1,190	1,110	443 *	193	160	460	402
5	2,020	1,140	870	1,130	1,080 *	1,190	1,090	418	162	162	412 *	458
6	2,080 *	1,180	849	1,210	1,040	1,180 *	1,110	341	186	159	424	458
7	1,960	1,220	838	1,250 *	1,020	1,190	1,060	328	228	137 *	402	510
8	1,820	1,250	855	1,230	1,010	1,190	993	313	236	130	445	547
9	1,690	1,280	947	1,170	1,080	1,230	937	334	191 *	132	448	407 *
10	1,560	1,310 *	972 *	1,150	1,150	1,200 *	941 *	455	141	145	428	390
11	1,420	1,240	937	1,130	1,220	1,070	1,020	557	117	197	423	382
12	1,290	1,170	930	1,120	1,220	959	1,080	503 *	113	236	417	367
13	1,160 *	1,100	955	1,110	1,200	988	1,160	417	111	260	402 *	351
14	1,130	1,030	938	1,110	1,230	879	1,220	359	148	322	384	337
15	1,090	972	947	1,070 *	1,290 *	859	1,270 *	317	394	553 *	362	323
16	1,060	900	1,030	1,080	1,300	407	1,280	293	414 *	399	334	316 *
17	1,010	818	1,080 *	1,060	1,280	0	1,270	251	409	376	324	316
18	992	743 *	1,080	1,120	1,280	0	1,330	207	381	316	299 *	316
19	955	811 *	1,040	1,170	1,280	0	1,340	165	337	238	300	323
20	918	922	1,020	1,230	1,270	0	1,390	129 *	316	170	319	323
21	898 *	658	1,030	1,230	1,240	0	1,430	174	296	173 *	321	330
22	882	690	1,030	1,240	1,240 *	0	1,440 *	238	295	193	321	330
23	869	818	1,040	1,280	1,240	0	1,400	385	277 *	227	350	361 *
24	858	846	1,080	1,380	1,250	0	1,260	618	255	271	356	307
25	854	867 *	1,000 *	1,420	1,260	0	1,210	1,070 *	194	352	355	317
26	844	898	887	1,440	1,270	0	1,160	1,090	186	404	367	343
27	835	944	793	1,480	1,250	367	1,090	864	187	437	370	353
28	824 *	978	813	1,470 *	1,210	1,170	1,010	675	194	474 *	354	371
29	872	819	1,370	1,210	1,300	949 *	508	189	542	324	400	400
30	921	971	1,390	1,200	1,360	860	414	169	528	344	432 *	419
31	972	1,010	1,200	813	813	326	510					
<b>Sum</b>	<b>28,088</b>	<b>36,240</b>	<b>21,299.0</b>	<b>14,043</b>					<b>8,619</b>		<b>11,675</b>	
	39,514	29,792	37,520	35,863					7,193		11,488	

**Current Year 1987**

**Period 1938-1987**

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	13.51	13.17	6	2,120	28	818	1,270	78,375	7,471	78,375
Feb.	13.63	12.28	10	1,320	21	597	1,000	55,712	6,190	55,712
Mar.	13.07	12.48	117	1,090	28	761	961	59,092	5,445	59,092
Apr.	13.41	12.92	28	1,530	1	1,010	1,210	71,881	6,316	77,000
May	13.58	13.11	1	1,360	7	985	1,210	74,420	12,285	309,000
June	13.41	8.00	30	1,390	117	0	710	42,246	10,919	240,000
July	13.29	12.82	22	1,450	31	776	1,160	71,133	13,899	140,000
Aug.	13.29	11.88	25	1,190	20	120	453	27,854	13,074	127,000
Sept.	12.66	11.84	116	461	111	107	240	14,267	15,776	147,000
Oct.	12.59	11.87	15	801	3	107	278	17,096	13,728	0
Nov.	12.48	11.84	13	611	30	228	383	22,786	9,494	86,360
Dec.	12.58	7.82	8	1,080	3	109	377	23,157	10,197	123,709
	13.63	7.82		2,120	0	771	558,019	124,794	1,270,400	1,662
<b>Yearly</b>	<b>Meters</b>			<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>		
	4.15	2.38		60.0	0	21.8	688,305	153,931	1,567,013	2,050

\*\* Period 1924-1987

\* Discharge measurement made on this day

! And other days

08-3712.00 RIO GRANDE NEAR CANDELARIA, TEXAS  
AND SAN ANTONIO DEL BRAVO, CHIHUAHUA

**DESCRIPTION:** Cableway, gravity well, and digital recorder located on the left bank of the Rio Grande at San Antonio Diversion Dam, latitude 30° 10' 30", longitude 106° 41' 10" and river mile 1,038.8 (1,671.8 km), 0.5 river mile (0.8 km) upstream from Capote Creek and about 2.5 miles (4.0 km) north of Candelaria, Texas and San Antonio, Chihuahua. The zero of the gage is 2,857.96 feet (871.11 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 29 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: November 19, 1975 through 1987.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the flow at this station. An auxiliary well, located 300 feet (91 m) upstream, is used to record extreme low flows. Prior to June 1979 the zero of the gage was 2,857.84 feet (871.07 m) above mean sea level, U. S. C. & G. S. datum.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 19,800 second-feet (561 m<sup>3</sup>/sec) on September 30, 1978 with a gage height of 10.86 feet (3.31 m). Min. frequently no flow.

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,740	1,720	1,870	1,210	1,600	4,950	1,200	1,310	1,630	398	463	327
2	2,660	1,700	2,020	1,030	1,690	3,240	954	1,250	1,860	384	474	329
3	2,570	1,670	2,050	803	1,740	2,980	1,100	1,110	1,720	386	475	323
4	2,540	1,640	1,930	747	1,810	2,630	1,340	975	1,400	383	460	314
5	2,520	1,660	1,830	816	1,960	2,370	1,660	892	1,200	365	438	316
6	2,480	1,760	1,770	934	2,100	2,290	2,010	903	1,050	342	430	314
7	2,480	1,860	1,730	1,080	2,090	3,040	2,180	901	792	323	428	309
8	2,530	1,910	1,720	1,130	2,020	11,700	2,180	836	731	329	422	292
9	2,560	1,930	1,690	1,150	1,970	6,910	2,130	875	622	364	414	297
10	2,590	1,920	1,660	1,160	1,890	3,690	1,980	886	485	383	396	307
11	2,610	1,910	1,390	1,190	1,830	2,900	1,870	731	476	371	415	304
12	2,640	1,870	1,190	1,240	1,810	2,660	1,830	765	468	347	415	306
13	2,680	1,830	1,090	1,300	1,720	2,720	1,830	891	498	325	392	339
14	2,710	1,820	1,050	1,350	1,590	2,630	1,760	702	494	301	391	362
15	2,730	1,790	1,080	1,350	1,550	2,580	1,690	680	425	305	377	336
16	2,760	1,790	1,150	1,310	1,640	2,650	1,580	800	386	352	354	332
17	2,790	1,790	1,130	1,260	1,790	2,760	1,580	857	349	402	346	338
18	2,810	1,710	1,040	1,240	2,010	2,310	1,630	809	349	487	339	356
19	2,730	1,660	1,020	1,250	2,200	1,330	1,940	719	374	516	324	371
20	2,610	1,690	1,010	1,280	2,230	881	2,370	710	463	533	314	373
21	2,480	1,770	978	1,270	2,200	709	2,180	734	561	594	304	374
22	2,370	1,860	1,010	1,420	2,280	546	1,980	660	596	567	316	361
23	2,300	1,900	1,080	1,430	2,420	427	1,850	693	595	555	324	360
24	2,200	1,880	1,130	1,430	2,440	429	1,730	769	591	550	319	361
25	2,030	1,860	1,170	1,520	2,450	459	1,690	1,080	572	498	313	360
26	1,940	1,820	1,120	1,520	2,520	533	1,690	1,360	576	466	316	323
27	1,890	1,750	1,090	1,600	2,640	593	1,750	885	537	438	318	312
28	1,800	1,760	1,130	1,540	2,700	588	1,790	1,110	517	427	324	303
29	1,760	1,160	1,470	3,600	786	1,730	717	497	437	332	299	
30	1,740	1,190	1,480	4,610	1,070	1,550	802	463	469	335	286	
31	1,720	1,240	3,980	1,380	950			467				297
<b>Sum</b>	<b>50,230</b>		<b>37,510</b>		<b>76,321</b>		<b>27,362</b>		<b>13,064</b>		<b>10,181</b>	
	74,970		41,658		69,080		54,134		21,267		11,268	

**Current Year 1987**

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Low			Average	Maximum	Minimum	
Jan.	8.28	6.43	18	2,870	31	1,680	2,420	148,701	17,752	148,701	
Feb.	6.78	6.38	19	1,960	119	1,650	1,790	99,630	13,314	99,630	
Mar.	6.78	5.62	3	2,100	21	965	1,340	82,627	11,357	82,627	
Apr.	7.11	5.46	24	2,440	4	738	1,250	74,400	9,088	74,400	
May	9.05	6.01	30	6,180	11	1,540	2,230	137,018	15,505	137,018	
June	10.29	5.08	8	22,100	23	402	2,540	151,380	21,179	151,380	
July	6.87	5.29	20	2,430	2	915	1,750	107,373	22,186	120,337	
Aug.	6.23	4.83	25	1,650	14	628	883	54,272	18,770	59,936	
Sept.	6.14	4.55	2	1,870	18	337	709	42,182	26,594	135,232	
Oct.	5.05	4.52	21	609	14	294	421	25,912	24,686	101,887	
Nov.	4.87	4.59	12	475	21	303	376	22,350	17,826	107,502	
Dec.	4.83	4.58	22	394	31	272	328	20,194	18,839	151,934	
<b>Yearly</b>	<b>10.29</b>	<b>4.52</b>		<b>22,100</b>		<b>272</b>	<b>1,330</b>	<b>966,039</b>	<b>217,096</b>	<b>966,039</b>	<b>15,148</b>
	<b>Meters</b>			<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>				
	3.14	1.38		626		7.70	37.7	1,191,590	267,784	1,191,590	18,685

\* Discharge measurement made on this day      ! And other days

08-3715.00 RIO GRANDE ABOVE RIO CONCHOS NEAR PRESIDIO, TEXAS  
AND OJINAGA, CHIHUAHUA

**DESCRIPTION:** Cableway, bubbler gage, and digital water-stage recorder located on the left bank at latitude 29°36'15", longitude 104°27'05", and river mile 963.7 (1,551.0 km); 5.0 river miles (8.0 km) upstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua and 2.5 river miles (3.8 km) upstream from the Rio Conchos. The zero of the gage is 2,573.14 feet (784.29 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 28 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1889 through 1987.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. Prior to 1978 the zero of the gage was 2,576.66 feet (785.37 m) above mean sea level, U. S. C. & G. S. datum.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 14,000 second-feet (396 m<sup>3</sup>/sec) on June 14, 1905. Highest flow recorded since 1924 was 5,160 second-feet (146 m<sup>3</sup>/sec), with a gage height of 10.57 feet (3.22 m), on May 26, 1942. Min. frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second) \*\*

Daily	Max.	13,700 (388)	June 13 & 14, 1905	Min. 0	Frequently
Monthly	Max.	10,150 (287)	June 1905	Min. 0	Frequently
Yearly	Max.	1,970 (55.8)	1907	Min. 1.3 (0.04)	1964

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,540	1,650	1,670	1,040	1,580 *	2,620	544	1,900	718	1,020	450	356
2	2,590	1,600	1,650	1,060	1,430	3,070	643 *	1,790	803 *	647	426	350 *
3	2,660	1,630	1,580	1,100 *	1,300	3,550 *	791	1,540	942	482	413	356
4	2,690	1,700	1,560	1,190	1,300	3,490	847	1,400 *	1,170	427	430 *	356
5	2,690 *	1,770	1,730	1,160	1,350	3,420	660	1,290	1,480	411 *	455	356
6	2,660	1,830	1,600	961	1,450	3,110	714	1,070	1,620	396	454	350
7	2,620	1,880	1,530	806	1,760	2,820	837	901	1,370	362	469	343
8	2,590	1,930	1,560	794	1,730	2,890	1,030	826	1,040	322	467	329
9	2,540	1,960	1,570	842	1,800	2,760	1,330	820	757	291	443	317
10	2,540	2,120	1,580	920	1,920	2,960	1,700	861	518	305	426	292
11	2,520	1,770	1,580	993	1,910	3,560	1,870	803	329	355	417	300
12	2,510	1,870	1,530	1,060	1,840	3,540	1,910	1,050 *	245	389	408	326
13	2,520	1,920	1,500	1,070	1,770	3,450	1,790	897	233	379	440	326
14	2,530	1,920	1,380	1,070	1,680	3,000	1,710	677	240	345	431	322
15	2,510	1,860	1,150	1,100	1,590	2,510 *	1,700	731	275	319	399	355 *
16	2,520	1,770	968	1,150 *	1,520	2,370	1,830 *	647	276	301 *	389	372
17	2,530	1,680	878 *	1,220	1,400	2,220	1,660	911	218	300	373 *	364
18	2,530	1,650 *	847	1,310	1,310	2,080	1,660	728 *	180	753	346	358
19	2,500	1,670	880	1,340	1,310	1,930	1,740	649	168	566	324	359
20	2,500	1,680	916	1,290	1,380	1,790	1,890	599	184	573	315	369
21	2,510	1,650	935	1,330	1,580 *	1,650	1,920	468	252	573	318	375
22	2,490 *	1,620	872	1,750	1,790	1,280 *	1,820	419	367	609	319	383
23	2,430	1,530 *	848	1,500	1,930	630	2,040	439	519 *	677	308	387
24	2,340	1,520	817	1,390	2,000	511	2,200	531	633	673	315	392
25	2,240	1,580	807	1,390	2,020	374	2,090	631	695	657	321	404
26	2,170	1,680	815	1,380	2,090	1,070	1,940	572	705	636	322	409
27	2,080	1,720	834	1,490	2,210	920	1,770	685	709	498 *	307	412
28	1,980	1,680	938	1,550	2,300	1,400	1,680	911	718	395	310	387
29	1,870		968	1,300	2,350	1,600	1,690 *	1,080	1,230	378	326	369
30	1,800		1,000	1,380	2,400	434	1,760	762	1,400	391	334	360
31	1,740		1,020	2,490			1,870	640		420		355
<b>Sum</b>	48,840		35,936		66,569		27,228		14,870		11,088	
	74,940		37,513		54,490		47,636		19,994		11,455	

Current Year 1987

Period 1938-1987

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	8.52	7.09	14	2,720	31	1,710	2,420	148,641	8,446	148,641
Feb.	8.01	6.73	10	2,190	24	1,490	1,740	96,873	6,539	96,873
Mar.	7.43	5.21	1	1,830	124	800	1,210	74,406	4,978	74,406
Apr.	7.62	5.15	27	2,040	7	781	1,200	71,278	4,019	71,278
May	7.75	6.09	31	2,530	13	1,280	1,760	108,079	9,485	240,000
June	10.06	2.85	11	3,870	26	1,244	2,220	132,038	11,385	216,000
July	7.47	3.31	24	2,230	1	433	1,540	94,485	13,815	156,000
Aug.	6.87	3.37	1	1,930	22	406	878	54,006	13,247	133,000
Sept.	6.53	2.53	30	2,020	118	167	666	39,657	16,822	151,000
Oct.	4.66	2.42	11	1,130	17	281	480	29,494	16,067	105,000
Nov.	3.12	2.61	7	486	25	293	382	22,721	8,372	101,617
Dec.	3.08	2.44	126	422	11	277	358	21,993	8,798	136,155
<b>Yearly</b>	10.06	2.42		3,870		167	1,230	893,671	121,973	1,176,700
	Meters			Cubic Meters per Second					Thousands of Cubic Meters	
	3.07	.74		110		4.73	34.8	1,102,325	150,451	1,451,436
										1,174

\*\* PERIOD JUNE 1900-MARCH 1914; SEPTEMBER 1919-MARCH 1920; and 1924-1987

\* Discharge measurement made on this day

! And other days

## 08-3730.00 RIO CONCHOS NEAR OJINAGA, CHIHUAHUA

**DESCRIPTION:** Cableway, gravity well, and water-stage recorder located on the right bank at latitude  $29^{\circ} 34' 55''$ , longitude  $104^{\circ} 25' 50''$ , 0.5 river mile (1.0 km) from the confluence with the Rio Grande, 2.5 miles (4 km) northwest of Ojinaga, Chihuahua, and 3.7 miles (6 km) northwest of Presidio, Texas. This stream enters the Rio Grande at river mile 961.4 (1,547.2 km), 11.6 river miles (18.7 km) upstream from the "Rio Grande below Rio Conchos" Gaging Station. The zero of the gage is 2,560.37 feet (780.40 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 136 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1896 through 1987. Prior to April 4, 1954, flow records were determined from records of the Rio Grande at stations located upstream and downstream from the Rio Conchos confluence.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. La Boquilla Reservoir, La Colina Reservoir, La Rosettilla Reservoir, and Luis L. Leon Reservoir are located 252 (405), 244 (393), 188 (302), and 114 (183) river miles (km), respectively, upstream from this station. Francisco I. Madero Reservoir is located on the Rio San Pedro, a tributary which enters the Rio Conchos 176 river miles (283 km) upstream from this station. Power generation facilities: La Boquilla 14,647 kw., La Colina 3,620 kw., La Rosettilla 5,150 kw., Francisco I. Madero and Luis L. Leon, none. The station was relocated on January 20, 1978 incident to the Rio Grande channel rectification in the Presidio-Ojinaga area.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. (period 1968-1987) 71,300 second-feet (2,020 m<sup>3</sup>/sec), on September 30, 1978. The greatest recorded flow occurred September 11, 1904 with a peak flow estimated at 162,000 second-feet (4,590 m<sup>3</sup>/sec).

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily: Max. #	52,600 (#1,490)	Oct. 1, 1978	Min. 23.0 (.65)	Dec. 19, 1973
Monthly: Max.	10,700 (302)	Oct. 1978	Min. 57.9 (1.64)	Feb. 1968
Yearly: Max.	2,340 (66.4)	1978	Min. 491 (13.9)	1983

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	224	194	562	1,060	1,230	911	763	2,350	1,210	2,050	512	307
2	231	207	830	1,030	1,170	929	692	2,990	1,210	1,890	484	238
3	238	189	1,240	1,030	1,120	1,030	699	2,810	1,210	1,730	466	238
4	248	183	1,200	1,050	1,070	992	678	2,840	1,210	1,580	456	231
5	260	192	1,730	1,310	1,010	975	607	2,550	1,330	1,420	452	204
6	268	191	1,890	996	1,040	1,020	607	2,280	1,280	1,270	456	298
7	276	220	1,950	939	1,220	1,010	618	2,070	1,130	1,230	452	349
8	273	261	1,910	925	1,420	4,980	650	1,970	989	1,200	448	360
9	270	274	1,900	925	1,470	2,830	699	2,030	1,060	1,250	434	357
10	252	289	1,860	925	1,530	1,230	872	1,850	989	1,240	434	371
11	246	338	1,830	925	1,540	1,030	2,100	2,060	908	1,230	434	374
12	246	371	1,810	925	1,460	1,070	1,230	2,600	883	1,200	434	381
13	246	392	1,790	932	1,390	1,020	544	1,710	883	1,190	434	385
14	245	403	1,730	929	1,360	939	1,180	1,460	879	1,180	434	396
15	242	392	1,580	925	1,370	996	2,550	1,510	918	1,160	434	399
16	242	385	1,480	925	1,250	996	2,180	1,520	876	1,150	434	388
17	239	350	1,380	925	1,170	1,020	1,630	1,500	865	1,150	434	392
18	238	351	1,310	925	908	1,250	1,590	1,230	862	1,460	434	396
19	237	374	1,290	925	1,200	1,190	1,650	956	763	1,540	441	399
20	234	452	1,280	932	1,130	1,230	1,650	840	742	1,240	445	403
21	228	505	1,260	2,010	1,020	1,210	1,510	703	706	1,200	445	417
22	215	523	1,260	3,350	1,120	837	1,270	791	823	1,220	445	406
23	201	530	1,250	2,330	1,240	731	1,500	992	996	1,260	445	399
24	182	526	1,190	1,610	1,050	657	1,780	1,110	749	1,250	441	396
25	173	523	1,090	1,890	1,010	600	1,780	1,040	742	1,260	298	403
26	171	533	1,090	1,550	975	2,190	1,680	1,130	908	999	326	410
27	170	544	1,110	2,510	978	2,240	1,620	950	929	770	466	410
28	167	562	1,170	2,270	1,010	1,710	1,610	2,420	943	727	438	406
29	164	1,260	1,500	1,020	992	1,540	2,580	2,390	699	452	403	396
30	163	1,210	1,460	1,020	713	1,610	2,530	2,150	643	477	396	392
31	162	1,140	1,140	1,240	1,240	1,610	3,100	586				

Sum 10,254 39,938 38,528 56,480 37,974 11,304  
6,951 43,582 36,741 40,699 31,533 13,185

## Current Year 1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Period 1968-1987		
	High	Low	Day	Day			Average	Maximum	Minimum
Jan.	4.40	3.31	7	278	31	161	224	13,788	33,935
Feb.	4.66	3.18	28	562	4	183	367	20,336	124,386
Mar.	5.41	4.40	7	1,980	1	562	1,410	49,926	201,219
Apr.	8.69	4.17	27	5,300	!	925	1,330	44,788	89,875
May	5.69	4.24	1	1,680	18	840	1,190	50,955	123,749
June	10.76	3.61	8	6,530	25	593	1,290	76,384	139,972
July	7.91	3.51	15	3,680	6	583	1,310	80,769	6,008
Aug.	7.35	3.67	!	3,870	!	650	1,820	112,030	154,562
Sept.	9.02	3.17	29	5,070	!	660	1,050	62,558	16,654
Oct.	6.05	3.14	18	2,270	31	519	1,230	75,327	243,660
Nov.	3.27	2.30	26	551	!	251	438	26,161	31,728
Dec.	3.51	2.84	21	427	5	173	364	22,417	16,883
Yearly	10.76	2.30		6,530		161	1,003	728,435	1,698,395
	Meters		Cubic Meters per Second		Thousands of Cubic Meters		898,516	996,011	2,094,945
	3.28	0.70		185		4.57	28.4	439,780	

\*\* Period 1968-1987

# Estimated

\* Discharge measurement made on this day

! And other days

## 08-3740.00 ALAMITO CREEK NEAR PRESIDIO, TEXAS

**DESCRIPTION:** Gravity well and digital water-stage recorder located on the left bank 300 feet (91.4 m) upstream from the highway bridge on Farm-to-Market Road 170 at latitude 29° 31' 25", longitude 106° 17' 15", about 2,000 feet (610 m) from the confluence with the Rio Grande, and about 6 miles (9.7 km) southeast of Presidio, Texas. This stream enters the Rio Grande near the lower end of the Presidio Valley at river mile 950.1 (1,529.1 km) 8.6 river miles (13.8 km) downstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua. Measurements of high flows are made from the highway bridge. The zero of the gage is 2,541.61 feet (774.68 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 60 discharge measurements during the year at low and medium flows, a high flow rating curve determined by slope-area calculations, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1932 through 1987.

**REMARKS:** A small irrigation reservoir (San Esteban) 10.5 miles (16.9 km) south of Marfa, Texas and irrigation diversions below the reservoir modify the flow of this spring-fed creek. Backwater from the Rio Grande begins to affect the station record when the flow at the station on the Rio Grande below Rio Conchos reaches about 35,000 second-feet (991 m³/sec).

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 56,400 second-feet (1,600 m³/sec), determined by slope-area calculations, on September 2, 1962, with a gage height of 13.54 feet (4.13 m). Min. 0.01 second-foot (0.003 m³/sec) occasionally.

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily: Max. 12,400 (351)	Sept. 21, 1974	Min. 0.1 (0.003)	Occasionally
Monthly: Max. 998 (28.3)	Sept. 1974	Min. 0.2 (0.005)	July 1980
Yearly: Max. 97.1 (2.75)	1974	Min. 3.2 (0.09)	1982

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.4	2.1	3.4	2.1	1.9	18.1	27.3	0.4	2.0	1.7	1.5	1.5
2	1.8	2.1	3.2	1.8	2.0	6.8	1.5	39.4	1.5	1.4	1.7	1.5
3	1.8	2.1	2.5	2.0	1.7	1.4	1.3	1.4	1.4	1.2	2.0	1.5
4	1.8	2.5	2.6	2.1	1.7	1.2	1.4	0.9	1.4	1.0	1.6	1.5
5	*	2.0	2.4	2.1	*	0.9	1.5	1.2	0.9	1.5	0.8	1.4
6	1.9	2.4	2.9	2.1	7.2	1.5	1.6	0.9	1.4	1.0	1.3	1.2
7	1.5	2.4	3.1	2.1	3.1	1.6	0.7	0.9	1.2	1.2	1.3	*
8	1.6	2.6	3.3	2.5	1.9	1.9	0.8	0.9	1.1	1.2	1.1	1.2
9	1.7	*	2.7	2.2	2.5	1.8	1.7	0.8	1.1	1.2	1.3	*
10	1.8	2.9	1.7	2.4	1.7	1.9	1.0	*	1.2	1.4	1.3	1.2
11	2.0	2.9	1.7	2.4	1.6	1.8	1.2	1.2	1.4	1.4	1.1	1.2
12	*	2.1	2.9	1.7	2.5	1.6	1.3	1.0	1.4	1.5	1.1	1.2
13	2.1	2.9	1.5	3.2	1.7	1.7	1.3	0.8	1.5	1.6	1.0	1.3
14	2.2	2.9	1.8	*	2.7	1.8	1.8	4.1	0.8	1.6	1.1	*
15	1.8	2.7	1.8	1.6	1.8	*	1.7	9.2	1.1	1.4	1.6	1.2
16	1.5	2.6	*	2.0	1.4	1.8	1.7	56.0	0.8	1.5	1.4	*
17	1.4	*	2.5	2.2	1.2	1.8	1.6	15.2	*	0.8	1.5	1.3
18	1.1	2.6	2.2	1.1	*	1.9	1.6	12.7	0.9	1.7	1.5	1.4
19	1.3	2.4	2.4	1.4	2.8	1.8	61.0	0.9	1.6	1.5	1.2	1.5
20	*	1.4	2.5	2.1	*	1.7	3.3	1.8	*	1.6	1.5	1.6
21	1.4	2.5	2.3	1.4	4.3	1.8	31.7	0.9	*	1.6	1.4	1.3
22	1.7	2.3	2.3	1.0	4.6	*	1.7	15.4	97.3	1.6	1.4	1.9
23	1.7	*	2.5	2.4	0.5	3.8	2.2	6.8	159	1.6	1.3	*
24	1.7	2.1	2.5	0.2	3.8	2.7	1.2	*	23.8	1.6	1.3	1.5
25	1.8	2.3	2.7	0.2	3.3	3.2	0.7	4.5	1.6	1.2	1.3	1.5
26	*	1.8	1.9	2.9	0.1	3.0	6.6	1.1	3.9	1.6	*	1.4
27	1.8	3.3	2.9	0	*	2.1	38.5	*	1.2	3.3	1.6	1.2
28	1.8	4.3	2.8	*	84.2	1.8	1.6	1.1	2.6	*	2.9	1.3
29	1.8	*	2.2	35.6	1.7	*	1.2	0.9	12.1	204 *	1.4	1.5
30	1.8	*	2.2	1.4	1.7	9.4	0.9	0.9	2.3	25.4	1.4	*
31	1.8	*	2.1	122			0.7	1.7	1.5			1.1
<b>Sum</b>		72.3	165.5	123.8		368.5		41.7		41.5		
	54.3	74.8	196.1	335.2		272.7		39.4				

## Current Year 1987

## Period 1932-1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High			Day	Average	Maximum
Jan.	5.19	5.11	1 1	2.5	118	0.9	1.8	108	132
Feb.	5.18	5.10	127	4.7	1 3	1.8	2.6	143	176
Mar.	5.19	5.12	1 1	3.4	13	1.3	2.4	148	149
Apr.	6.58	5.11	28	135	27	0	5.5	328	260
May	7.97	5.12	31	1,700	5	0	6.3	389	854
June	7.01	5.47	30	140	29	0.8	4.1	246	1,869
July	7.17	5.08	19	364	24	0.3	10.8	665	2,822
Aug.	8.91	5.07	22	3,700	1	0.3	11.9	731	2,973
Sept.	7.21	5.20	29	1,100	8	1.1	9.1	541	4,405
Oct.	5.27	5.20	1 1	1.9	1 5	0.8	1.3	82.7	19,200
Nov.	5.30	5.23	3	2.1	1 9	1.0	1.3	78.1	188
Dec.	5.27	5.21	122	1.9	29	1.0	1.3	82.3	139
	8.91	5.07		3,700		0	4.9	3,542	15,794
<b>Yearly</b>	<b>Meters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>		
	2.72	1.55	105	0	0.14	4,369	19,482	86,682	2,862

\* Discharge measurement made on this day

! And other days

08-3742.00 RIO GRANDE BELOW RIO CONCHOS NEAR PRESIDIO, TEXAS  
AND OJINAGA, CHIHUAHUA

**DESCRIPTION:** Cableway, bubbler gage, concrete control weir, water-stage recorders (graphic and digital), and data collection platform located on the left bank at latitude 29° 31' 10", longitude 104° 17' 10", and river mile 949.8 (1,528.5 km); 0.4 river mile (0.6 km) downstream from Alamito Creek and 9.0 river miles (14.4 km) downstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua. The zero of the gage is 2,532.00 feet (771.75 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 28 discharge measurements during the year and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: 1955 through 1987. Records are also available from 1896 through June 13, 1932 for a station located about 12.1 river miles (19.5 km) downstream from the Rio Conchos and 1.3 miles (2.1 km) upstream from Alamito Creek; and from June 14, 1932 through 1954 for a station about 2.0 river miles (3.2 km) downstream from the Rio Conchos and 11.4 river miles (18.3 km) upstream from Alamito Creek.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. The data collection platform, operated in cooperation with the National Weather Service, relays gage height data upon interrogation by telephone via commercial circuits. Prior to December 1, 1979, the zero of the gage was 2,536.00 feet (772.97 m) above mean sea level, U. S. C. & G. S. datum.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 61,200 second-feet (1,730 m<sup>3</sup>/sec) on September 30, 1978 with a gage height of 15.41 feet (4.70 m). The greatest recorded flow occurred September 11, 1904, with a peak flow estimated at 162,000 second-feet (4,590 m<sup>3</sup>/sec) at a station 11.8 miles (19.0 km) upstream. Min. 0.2 second-foot (0.01 m<sup>3</sup>/sec) several days in July 1955, and on June 30, 1958.

## Average Flow in Second-Feet (Cubic Meters per Second) \*\*

Daily	Max. 53,300 (1,510)	Oct. 1, 1978	Min. 12.9 (0.37)	March 27, 1968
Monthly	Max. 11,500 (326)	Oct. 1978	Min. 74.5 (2.11)	March 1968
Yearly	Max. 2,440 (69.1)	1986	Min. 602 (17.0)	1983

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,140	1,950	2,950	2,280	2,870 ■	3,560	1,410	4,340	2,170	2,510	961	616
2	3,230	1,900 *	2,930	2,270	2,730	4,050	1,370 ■	4,930	2,180 ■	2,160	928	593 *
3	3,310	1,790	2,810	2,290 ■	2,520	4,920	1,430	4,610	2,250	2,030	880 ■	595
4	3,350	1,770	2,700 ■	2,390	2,490	5,260 ■	1,530	4,620	2,410	2,070	856	595
5	3,260 ■	1,820	3,240	2,410	2,450	5,430	1,380	4,230	2,780	2,120 ■	859	568
6	3,130	1,860	3,620	2,250	2,570	4,990	1,380	3,870	2,860	2,090	880	652
7	3,090	1,880	3,730	2,050	3,040	4,420	1,460	3,360	2,510	2,000	893	727
8	3,090	1,980	3,630	1,990	3,450	9,150	1,580	2,840	2,110	1,900	895	736
9	3,040	2,020	3,570	2,010	3,570	7,570	1,720	2,480	1,950	1,940	789	740
10	3,050	2,080	3,510	2,060	3,800	5,620	2,010	2,280	1,800	1,940	660	736
11	3,090	2,210	3,460	2,170	3,940	6,700	2,200	2,300	1,580	1,940	621	728
12	3,090	2,330	3,430	2,300	3,690	7,470	2,580	3,180	1,450	1,930	610	746
13	3,070	2,440	3,380	2,350	3,560	6,230	2,250	2,730	1,420	1,860	598	750
14	3,110	2,500	3,310	2,340	3,520	8,900	3,220	2,780	1,420	1,810	595	770
15	3,120	2,470	3,050	2,300	3,390	9,010	5,850	2,330	1,520	1,760	568	777
16	3,160	2,440	2,790	2,330 ■	3,160	3,670 ■	5,560 ■	2,210	1,460	1,730 ■	582 ■	781 *
17	3,170	2,350	6,610 ■	2,410 ■	2,880	3,710	3,720	2,410	1,400	1,730	616 ■	779
18	3,220	2,300 ■	2,450	2,460	2,390	3,640	2,960	2,260 ■	1,340	2,440	617	785
19	3,250	2,350	2,410	2,510	2,900	3,500	3,820	1,890	1,160	2,560	603	796
20	3,250	2,470	2,420	2,460	2,720	3,500	3,900	1,790	1,080	2,000	568	792
21	3,280 ■	2,740	2,450	3,340	2,730 ■	3,530	3,540	1,570	1,190	1,820	573	814
22	3,200	2,740	2,410	6,210	3,130	2,600 ■	3,170	1,570	1,290 ■	1,830	578	833
23	3,080	2,730	2,370	3,870	3,420	1,580	3,390	2,080	1,790	1,940	584	818
24	2,940	2,730	2,270	3,090	3,320	1,330	4,150	2,090	1,490	1,920	578	807
25	2,780	2,680	2,200	3,390	3,180	1,170 ■	4,220	2,090	1,480	1,930	583	811
26	2,610	2,790	2,180	2,910	3,110	3,530	3,960	2,340	1,710	1,710	566	816
27	2,470	2,900	2,220	3,460	3,230	5,070 ■	3,720	2,000	1,800	1,350	556	825
28	2,350	2,970	2,280	4,380	3,360	3,480	3,560	3,520	1,820	1,200 ■	570	833
29	2,180		2,360	2,780	3,700	2,540	3,480 ■	3,250	5,050	1,140	592	839
30	2,090		2,390	2,620	3,800	1,390	3,540	2,890	3,720	1,070	603	816
31	2,030		2,320	4,820	3,590	4,820	3,590	2,400	1,040			778

Sum 65,190 81,710 128,520 87,240 57,470 23,252  
92,230 87,450 99,440 91,650 58,210 20,362

## Current Year 1987 | Period 1968-1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	Day			Average	Maximum	Minimum		
Jan.	6.31	5.33	5	3,380	31	1,980	2,980	182,935	45,033	182,935	16,068
Feb.	5.94	5.14	28	3,030	4	1,740	2,330	129,302	39,598	129,302	4,745
Mar.	6.33	5.46	7	3,790	26	1,610	2,820	173,454	56,215	223,755	4,583
Apr.	8.05	5.30	22	9,060	7	1,980	2,720	162,069	50,763	162,069	6,497
May	7.09	5.55	29	5,540	18	2,300	3,210	197,236	59,067	197,236	12,147
June	8.75	4.43	8	11,600	26	1,060	4,280	254,916	70,718	254,916	5,927
July	8.29	4.84	15	9,100	1	1,340	2,960	181,785	77,710	223,914	18,744
Aug.	7.11	4.83	28	5,710	22	1,480	2,810	173,038	116,635	270,367	30,365
Sept.	8.18	4.20	29	9,830	20	1,050	1,940	115,458	177,660	469,832	22,489
Oct.	6.24	4.11	19	3,630	31	979	1,850	113,990	132,430	706,691	16,772
Nov.	4.11	3.23	1	979	126	555	679	40,387	53,637	160,145	8,741
Dec.	3.87	3.21	21	856	5	636	750	46,120	41,481	185,911	11,038
Yearly	8.75	3.21		11,600		536	2,450	1,770,690	920,947	1,770,650	483,092
	Meters		Cubic Meters per Second		Thousands of Cubic Meters						
	2.67	.98		329		15.2	69.4	2,184,111	1,135,970	2,184,061	595,884

\*\* Period 1968-1987

■ Discharge measurement made on this day

! And other days

## 08-3745.00 TERLINGUA CREEK NEAR TERLINGUA, TEXAS

**DESCRIPTION:** Cableway, gravity well, and digital water-stage recorder located on the left bank at latitude  $29^{\circ}11'50''$ , longitude  $103^{\circ}36'20''$ , 2.6 creek miles (4.2 km) from the confluence with the Rio Grande, and about 8.5 miles (13.7 km) south of Terlingua, Brewster County, Texas. This creek enters the Rio Grande at river mile 885.2 (1,424.6 km), the lower end of Santa Helena Canyon. The zero of the gage is 2,200.64 feet (670.76 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 39 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1932 through 1987.

**REMARKS:** Irrigation diversions modify the flow of this spring-fed creek at this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 34,900 second-feet (988 m<sup>3</sup>/sec) on May 24, 1935 with a gage height of 17.59 feet (5.36 m) on a gage 0.3 mile (0.5 km) downstream. Min. no flow on several occasions in 1986.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily: Max. 17,200 (487)	June 1, 1937	Min. 0	August 14 and 15, 1986
Monthly: Max. 1,150 (32.6)	Sept. 1974	Min. 0.8 (0.02)	October 1934
Yearly: Max. 146 (4.13)	1937	Min. 5.5 (0.16)	1943

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.7	3.2	3.2	2.6	517	460	14.9	2.7	18.9	66.6	3.6	3.9
2	4.3	3.2	3.3	2.6	339	35.9	14.8	2.8	14.8	25.1	3.5	3.9
3	3.4	3.3	3.2	2.6	173	25.8	14.7	2.9	11.6	15.1	3.6	3.9
4	3.1	5.4	3.2	2.6	3.7	14.7	14.6	6.9	9.3	9.6	3.6	3.9
5	2.6	10.6	2.8	3.1	3.8	13.8	15.4	11.0	7.2	6.6	3.6	4.1
6	2.9	10.5	3.2	3.2	38.0	13.5	15.5	15.0	4.9	4.5	3.6	4.1
7	2.7	10.5	3.2	3.2	56.3	13.8	15.7	19.0	3.4	4.3	3.7	4.1
8	3.4	8.9	3.2	3.2	19.3	1.6	15.8	23.0	2.5	4.1	3.7	4.1
9	3.3	8.9	3.2	2.7	4.9	0.3	15.9	27.1	1.8	4.0	3.7	3.9
10	3.4	8.1	3.2	3.2	3.1	4.4	16.1	31.1	2.1	3.7	3.7	3.9
11	2.8	7.6	3.0	3.4	3.0	0	16.2	35.1	3.7	3.6	3.7	3.8
12	2.3	8.9	2.6	3.8	2.8	0	16.3	39.2	5.2	3.5	3.7	3.8
13	3.0	8.0	3.4	3.8	4.3	0	16.3	43.2	7.0	3.3	3.6	3.7
14	3.2	8.9	3.8	3.8	13.4	0	16.7	47.2	22.5	3.2	3.6	3.7
15	3.8	6.0	3.8	3.3	372	0	19.8	51.2	29.5	3.3	3.6	3.7
16	3.2	4.6	3.7	2.9	64.4	0	23.0	55.2	25.9	3.3	3.5	3.8
17	3.7	3.3	3.5	2.8	24.4	0	26.2	211	26.3	3.4	3.6	3.8
18	2.8	3.2	2.7	2.6	12.5	3.8	29.3	53.3	75.2	19.6	3.7	3.9
19	2.6	3.3	3.0	3.3	222	0	32.4	47.3	145	5.9	3.7	3.8
20	3.2	3.1	2.6	3.2	71.9	0	35.6	41.2	50.9	3.7	3.7	3.8
21	3.7	3.1	3.2	3.2	44.8	0	31.6	35.2	25.2	3.7	3.7	1.0
22	3.7	2.6	3.0	828	28.6	0	27.6	29.2	11.5	3.7	3.8	3.7
23	3.0	3.2	2.7	1,390	24.4	0	23.6	772	6.6	3.6	3.8	3.6
24	3.2	3.2	2.2	1,350	1,010	1.1	19.6	1,030	2.8	3.7	3.8	3.5
25	3.2	3.8	2.4	1,100	1,160	4.8	15.7	238	5.4	3.7	3.8	3.4
26	3.2	3.8	2.6	931	463	*	0	11.7	713	10.6	3.7	3.8
27	3.3	4.6	2.6	1,200	1.7	0	11.7	597	36.7	3.6	3.8	3.2
28	3.2	3.9	3.2	1,020	0	0	*	3.7	482	19.9	3.7	3.9
29	3.2	3.2	2.5	843	0	0	3.6	366	1,070	3.6	4.0	3.0
30	3.5	3.5	2.2	680	0	0	3.4	250	219	3.6	3.9	3.0
31	3.8	2.1	2.1	1,360	0	0	3.3	19.0	3.5	3.5	3.0	3.0

Sum	157.9	9,407.1	593.5	5,296.8	236.5	111.4
100.4	92.5	6,041.3	540.7	1,875.4	111.0	

## Current Year 1987

## Period 1932-1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High			Average	Maximum	Minimum
Jan.	3.80	3.66	1	5.4	12	2.2	3.2	199	193
Feb.	3.82	3.70	5	12.2	120	2.6	5.6	313	225
Mar.	3.74	3.59	1	3.8	31	1.8	3.0	183	247
Apr.	5.61	3.60	23	0 1,390	1	2.6	314	18,659	1,471
May	7.99	4.09	31	6,400	428	0	195	11,983	3,626
June	5.91	3.44	1	843	1	0	19.8	1,177	7,161
July	3.80	20	0 35.6	31	0	3.3	17.4	1,072	8,104
Aug.	7.24	3.20	29	5,380	10	1.4	62.5	3,720	28,700
Sept.	5.51	3.26	18	453	14	3.2	7.6	469	6,225
Oct.	3.30	3.28	29	4.1	115	3.5	3.7	9,133	33,617
Nov.	3.34	3.27	18	4.4	31	2.9	3.6	221	123
Dec.				6,400	0	0	67.3	48,722	105,807
Yearly	Meters			Cubic Meters per Second			Thousands of Cubic Meters		
				181	0	1.91	60,098	50,439	130,511
									4,882

\* Discharge measurement made on this day      0 Mean daily      ! And other days

08-3750.00 RIO GRANDE AT JOHNSON RANCH NEAR CASTOLON, TEXAS  
AND SANTA ELENA, CHIHUAHUA

**DESCRIPTION:** Cableway, gravity well, digital water-stage recorder, and G.O.E.S. Data Collection Platform located on the left bank at latitude 29° 02' 05", longitude 103° 23' 25", and river mile 862.4 (1,388.0 km); 1.3 river miles (2.2 km) upstream from the old Johnson Ranch headquarters, 6.0 river miles (9.7 km) downstream from Smoky Creek, and 9.2 river miles (14.8 km) upstream from Chizos Crossing and the Chihuahua-Coahuila state line. The zero of the gage is 2,045.30 feet (623.41 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 13 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: April 1936 through 1987.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station.

The Data Collection Platform transmits gage heights by radio via NWS G.O.E.S. satellite to NWS computer bank.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 71,900 second-feet (2,940 m<sup>3</sup>/sec), on September 30, 1978 with a gage height of 28.40 feet (8.66 m). A flow estimated at 97,000 second-feet (2,750 m<sup>3</sup>/sec) with a stage of 24.6 feet (7.50 m) occurred at this station site on October 3, 1932. Min. no flow several days in 1953, 1955, 1957, and 1958.

				Average Flow in Second-Feet (Cubic Meters per Second) **											
Daily:	Max. 65,300 (1,850)	Oct. 1, 1978	Min. 27.5 (0.78)	Sept. 9, 1968			April 1976			Yearly 1983					
Monthly:	Max. 12,200 (345)	Oct. 1978	Min. 96.9 (2.74)	April 1976			Yearly 1983								
Yearly:	Max. 2,490 (70.5)	1978	Min. 559 (15.8)												

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	3,080	1,990	2,770	2,300 *	2,590	3,830	1,680 *	3,650	2,390	2,930 *	1,060	643 *	
2	3,100	1,950	2,750 *	2,290	2,680	3,170 *	1,560	4,140	2,060	2,230	1,010 *	654	
3	3,150	1,910 *	2,730	2,280	2,460	3,360	1,440	4,290 *	2,020	1,730	1,000	656	
4	3,190	1,850	2,610	2,300	2,270 *	3,700	1,460	4,260	2,070	1,570	964	648	
5	3,210	1,810	2,560	2,390	2,230	3,980	1,540	4,090	2,260	1,540	949	650	
6	3,190	1,810	3,000	2,410	2,180	4,030	1,470	3,860	2,670	1,550	936	647	
7	3,160	1,820	3,200	2,220	2,480	3,860	1,450	3,600	2,710	1,530	942	648	
8	3,130	1,830	3,260	1,980	2,690	3,720	1,490	3,380	2,360	1,480	938	717	
9	3,110	1,910	3,250	1,870	3,050	6,600	1,550	3,250	1,940	1,440	936	747	
10	3,090	1,940	3,230	1,840	3,160	5,510	1,750	3,570	2,510	1,450	902	756	
11	3,070	1,980	3,200	1,890	3,290	4,170	2,180	3,200	1,600	1,460	814	756	
12	3,030	2,110	3,180	1,960	3,380	4,830	2,770	3,530	1,440	1,470	751	755	
13	3,020	2,250	3,150	2,020	3,240	4,920	3,400	3,400	1,330	1,470	742	761	
14	3,020	2,370	3,130	1,990	3,180	4,220	2,750	2,870	1,280	1,440	726	753	
15	3,020	2,410	3,090	1,970	3,480	3,640	4,300	2,870	1,370	1,420	703	777	
16	3,020	2,390	2,850	1,970	3,120	3,340	5,570	2,630	1,370	1,410	681	795	
17	3,030	2,270	2,580	2,030	2,940	3,220	4,710	2,980	1,320	1,400	672	807	
18	3,030	2,140	2,380	2,080	2,770	3,180	3,620	2,540	1,510	1,390	679	812	
19	3,040	2,030	2,240	2,150	2,560	3,120	3,460	2,310	1,370	2,450	677	834	
20	3,010	2,050	2,190	2,260	2,670	3,110	4,720	1,840	1,150	2,130	677	829	
21	2,970	2,170	2,240	2,190	2,510	3,190	3,710	1,670	1,070	1,700	670	819	
22	2,980	2,400	2,240	3,790	2,960	3,500	1,470	1,040	1,630	558	828		
23	2,920	2,460	2,230	4,300	4,820	2,530	3,300	2,160	1,090	1,670	557	839	
24	2,870	2,520	2,200	3,290	3,920	1,710 *	3,430	3,320	1,480	1,800	660	837	
25	2,740	2,500	2,130	3,060	3,080	1,500	3,730	2,540	1,270	1,810	658	820	
26	2,640	2,510	2,050	3,030	2,830	1,480	3,740	3,890	1,350	1,820	653	814	
27	2,530	2,630	2,060	2,970	2,730	3,350	3,690	2,530	1,460	1,670	635		
28	2,400	2,730	2,090	4,060	2,710	3,950	3,590	2,280	1,480	1,350	629	840	
29	2,290	2,180	3,400	2,750	3,270	3,360	3,560	4,070	2,060	1,240	627	845	
30	2,120	2,280	2,360	2,750	2,700	2,690	3,530	3,340	4,480	1,160	629	842	
31	2,040				5,980	3,580	2,860	4,710	1,110			834	
<b>Sum</b>	<b>60,740</b>		<b>75,040</b>		<b>105,460</b>		<b>96,390</b>		<b>53,510</b>		<b>50,450</b>		<b>23,790</b>
	90,200		81,410		93,410		92,230						23,235

## Current Year 1987

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Period 1968-1987		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	5.20	4.22	1 4	3,220	31	1,990	2,910	178,909	178,909	15,003
Feb.	4.95	4.07	28	2,810	5	1,790	2,170	120,476	38,766	7,743
Mar.	5.39	4.33	7	3,300	26	2,030	2,630	161,474	53,655	21,676
Apr.	7.76	4.17	22	5,860	10	1,820	2,500	148,840	48,415	14,765
May	13.56	4.53	31	14,000	6	2,140	3,010	185,276	60,383	185,276
June	8.63	3.59	9	6,790	27	1,290	3,520	209,177	75,625	209,177
July	8.10	3.56	15	6,480	6	1,320	2,980	182,935	84,371	197,7593
Aug.	7.49	3.64	29	5,650	23	1,400	3,110	191,187	124,002	12,460
Sept.	7.57	3.15	30	5,620	22	996	1,780	106,135	180,356	242,539
Oct.	5.92	3.13	1	3,820	31	1,070	1,630	100,066	472,093	30,689
Nov.	3.13	2.40	1	1,070	30	622	774	46,086	751,755	17,776
Dec.	2.83	2.40	28	861	6	622	767	47,187	56,513	13,267
	13.55	2.40		14,000		622	2,320	1,677,748	956,136	1,801,958
<b>Yearly</b>	<b>Meters</b>			<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>			
	4.13	.73		396		17.6	65.7	2,069,469	1,179,375	2,222,679

\* Discharge measurement made on this day

! And other days

\*\* Period 1968-1987

08-3772.00 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TEXAS  
AND RANCHO SANTA ROSA, COAHUILA

**DESCRIPTION:** Cableway, bubbler gage, concrete control weir, and water-stage recorders (graphic and digital) located on the left bank at latitude 29° 46' 50", longitude 101° 45' 30", and river mile 657.5 (1,058.2 km); 500 feet (152 m) downstream from the Terrell-Val Verde County Line, 5.4 river miles (8.8 km) downstream from Lozier Canyon, and about 12.3 miles (19.8 km) west of Langtry, Texas. The zero of the gage is 1,157.17 feet (352.71 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 27 discharge measurements during the year, 20 by the United States Section and 7 by the Mexican Section of the Commission, and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: September 1961 through 1987.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. The concrete control weir was placed in operation on February 21, 1967. The transmitter relays gage height data upon interrogation from the Amistad Dam hydrographic office of the United States Section of the Commission. Transmission is via radio.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 148,000 second-feet (4,190 m³/sec) on November 5, 1978 with a gage height of 38.14 feet (11.63 m). Min. 188 second-feet (5.32 m³/sec) on August 19, 1965.

Average Flow in Second-Feet (Cubic Meters per Second) \*\*

Daily:	Max. 81,600 (2,310)	Sept. 20, 1974	Min. 217 (6.15)	July 1, 1968
Monthly:	Max. 14,700 (416)	Oct. 1978	Min. 322 (9.12)	March 1968
Yearly:	Max. 3,030 (85.8)	1978	Min. 845 (23.9)	1983

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,370	2,380	2,700	2,570	3,180	3,520	3,220	3,180	2,880	2,720	1,460	916
2	3,300	2,290	2,750	2,530	2,730	5,260	2,520	3,210	2,500	3,620	1,410	910
3	3,310	2,220	2,750	2,470	2,670	5,200	2,000	3,250	2,320	2,340	1,370	916
4	3,320	2,180	2,770	2,440	2,730 *	4,840	1,890	3,280	2,160	2,310	1,340	903
5	3,480	2,150	2,700	2,410	2,560	5,440	1,750	3,280	2,110	2,070	1,300 *	895
6	3,470	2,180	2,620	2,380	2,480	5,830	1,700 *	3,540	2,170	1,900	1,280	918
7	3,450	2,140	2,630	2,430	2,530	5,940	1,720	3,780	2,400	1,850	1,260	931
8	3,460	2,100	2,990	2,470	2,530	5,930	1,820	3,450	2,520	1,850	1,240	945
9	3,310	2,140	3,150	2,430 *	2,570	5,960	1,670	3,130	2,520	1,860	1,190	954
10	3,240	2,130	3,090	2,250	2,740	6,560	1,820	2,880	2,350	1,830	1,190	966
11	3,300	2,170	3,140	2,150	3,000	7,250 *	1,730	4,590	2,360	1,760	1,190	1,020
12	3,330	2,190	3,150	2,130	3,090	5,160	1,820	3,230	2,510	1,750	1,180	1,030
13	3,360	2,200	3,130	2,130	3,270	5,300	2,650	2,750	1,960	1,750	1,140	1,040
14	3,320	2,290	3,140	2,150	3,790 *	6,090	2,640	3,270	2,220	1,750	1,080	1,030
15	3,250	2,380	3,060	2,180	3,160	5,580	2,960	2,930	2,710	1,740	1,040	1,030
16	3,270	2,420	3,100 *	2,180	3,250	4,520	2,510	2,480	2,300	1,740	1,020	1,040
17	3,280	2,450	2,990	2,140	4,040	3,790	6,640	2,490	1,640	1,730	1,000	1,050
18	3,180	2,470	2,730	2,150	3,300 *	3,380	5,880	2,660	1,610	1,730	974	1,090
19	3,180	2,400	2,660	2,180	3,060	3,200	4,320	2,490	1,890	1,710	972	1,140
20	3,050	2,340	2,570	2,310 *	2,950	3,130	3,290	2,190	2,120	1,780	958	1,160
21	3,030	2,280	2,540	2,740	2,780	3,040	4,610	2,160	1,630	2,330	952	1,230
22	3,060	2,300	2,490	2,500	2,820	3,180	4,350	1,910	1,490	2,190	962	1,130
23	2,980	2,360	2,500	2,530	3,020	3,050	3,560	1,830	1,350	1,950	951	1,120
24	2,970	2,540	2,480	4,400	9,890	2,960	3,230	2,160	1,280	1,870	931	1,120
25	3,040	2,550	3,810	" 570	2,470	3,020	2,490	1,290	1,860	1,660	938	1,120
26	2,980	2,540	2,460	3,130	3,730	2,050	3,340	3,210	1,460	1,910	930	1,120
27	2,890	2,550	2,430	2,950	2,960	1,840	3,650	4,580	1,530	1,930	924	1,120
28	2,810	2,580	2,410	3,020	3,020	1,870	3,590	4,800	1,460	1,910	938	1,110
29	2,720	2,390	3,390	4,450	2,920	3,460	2,710	1,670	1,890	930	1,100	
30	2,620	2,390	4,210	2,910	3,830	3,280	4,760	1,720	1,660	1,660	930	1,110
31	2,490	2,490	3,040	3,200	3,330	3,200	1,540					1,130
<b>Sum</b>	64,920		78,760		131,580		96,000		60,830			32,294
	97,820		84,850		101,190		93,840		60,130			32,980

Current Year 1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low		Average	Maximum	Minimum
Jan.	3.58	3.13	5	3,670	31	2,440	3,160	194,023	61,615
Feb.	3.22	2.97	24	2,640	7	2,040	2,320	128,767	52,722
Mar.	3.51	3.09	16	3,460	27	2,350	2,740	168,297	69,040
Apr.	4.10	2.96	24	5,480	15	2,080	2,630	156,218	66,338
May	7.80	3.11	24	13,400	8	2,390	3,260	200,707	79,505
June	5.10	2.77	11	8,090	28	1,720	4,390	260,985	99,864
July	4.86	2.72	17	7,620	9	1,630	3,030	186,129	102,444
Aug.	5.02	2.78	28	7,930	24	1,730	3,100	190,413	128,767
Sept.	4.23	2.51	15	6,000	124	1,270	2,000	119,266	143,733
Oct.	3.88	2.64	1	4,670	31	1,490	1,960	120,654	106,521
Nov.	2.54	2.27	1	1,490	27	916	1,100	65,415	84,388
Dec.	2.50	2.25	21	1,260	5	889	1,040	64,054	59,630
	7.80	2.25		13,400		889	2,560	1,854,928	1,202,756
<b>Yearly</b>	<b>Meters</b>		<b>Cubic Meters per Second</b>		<b>Thousands of Cubic Meters</b>				
	2.38	.69		379		25.2	72.5	2,288,017	1,483,575
								2,708,859	754,478

\*\* Period 1968-1987

\* Discharge measurement made on this day

! And other days

## 08-4474.10 PECOS RIVER NEAR LANGTRY, TEXAS

**DESCRIPTION:** Cableway, concrete control weir, bubbler gage, and water-stage recorders (graphic and digital) located on the right bank at latitude 29° 48' 10", longitude 107° 26' 45", about 7.5 miles (12.1 km) east of Langtry, Texas, 9.5 river miles (15.3 km) upstream from the Pecos High Railroad Bridge, and 15.0 river miles (24.1 km) from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 616.0 (991.4 km); 23.6 river miles (38.0 km) downstream from Langtry, Texas. The zero of the gage is 1,133.08 feet (345.36 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 38 discharge measurements during the year, 20 by the United States Section and 15 by the Mexican Section of the Commission, and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on stable control weir rating curves defined by meter measurements. Records available: July 1967 through 1987. Records are also available for Pecos River near Comstock, 9.5 river miles (15.3 km) downstream, from March 17 through December 3, 1898 and May 1900 through October 7, 1954; for Pecos River near Shumla, 3.5 river miles (5.6 km) upstream, from October 8, 1954 through June 1967; and for Pecos River at Mouth near Comstock, from March 1961 through July 2, 1968.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. The transmitter relays gage height data upon interrogation from the Amistad Dam hydrographic office of the United States Section of the Commission. Transmission is via radio.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 577,000 second-feet (16,300 m<sup>3</sup>/sec) on September 20, 1974 with a gage height of 75.30 feet (22.95 m). The greatest flow of record, which exceeded a gage height of 100 feet (30.5 m) at this station, occurred on June 28, 1954. The peak discharge was 948,000 second-feet (26,800 m<sup>3</sup>/sec) at the gaging station located near the railroad bridge 9.5 river miles (15.3 km) downstream. Min. 58.3 second-feet (1.65 m<sup>3</sup>/sec) on July 27, 1974 with a gage height of 1.47 feet (0.45 m).

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 153,000 (4,330)	Sept. 20, 1974	Min. 59.5 (1.69)	Aug. 20, 21, & 22, 1970
Monthly:	Max. 13,500 (382)	Sept. 1974	Min. 68.0 (1.93)	August 1970
Yearly:	Max. 1,500 (42.5)	1974	Min. 131 (3.71)	1970

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	408	286	305	251	250	506	514	382	479	250	266	214
2	404	286	302	246	246	351	496	369	358	241	258	213
3	393	289	295	243	245	388	487	353	333	234	253	211
4	383	287	297	239	234	408	487	330	319	230	251	211
5	382	1,180	295	240	230	469	514	310	326	227	249	209
6	399	461	291	250	231	558	523	297	351	224	246	208
7	396	342	289	251	235	583	544	293	355	218	241	206
8	388	324	288	248	242	577	555	287	355	218	243	208
9	375	306	297	250	254	576	570	288	378	218	234	208
10	362	301	315	254	269	541	596	286	393	219	231	208
11	343	301	392	254	279	523	616	283	396	228	228	208
12	337	300	372	250	285	514	643	298	380	242	231	208
13	330	302	369	239	290	511	653	289	348	248	237	207
14	329	302	364	231	290	504	659	283	320	249	238	206
15	322	302	354	232	587	496	619	278	567	252	242	203
16	322	301	350	235	393	491	626	273	414	257	244	204
17	322	300	359	233	454	499	647	271	325	265	244	205
18	322	297	341	226	406	509	656	267	299	262	244	208
19	316	290	313	221	340	521	641	260	282	257	237	222
20	313	301	302	221	323	530	544	255	274	249	232	223
21	309	300	293	232	294	546	491	249	270	249	227	217
22	304	303	281	244	273	583	486	247	272	246	224	212
23	301	302	267	246	263	569	483	250	268	255	225	211
24	295	323	265	253	261	585	481	246	263	261	224	211
25	294	324	264	265	248	562	489	244	260	264	223	211
26	291	315	260	277	248	604	493	251	260	264	221	210
27	290	318	255	275	239	568	490	266	260	262	220	207
28	286	321	245	268	240	541	473	278	253	257	218	208
29	288	287	247	260	243	532	447	1,150	395	256	218	209
30	283	278	248	254	239	528	427	413	318	262	218	209
31	278	250	254	254	254	399	1,820			261		

Sum 9,564 7,388 15,673 11,366 7,625 6,504

10,365 9,365 8,885 16,749 10,071 7,067

## Current Year 1987

## Period 1967-1987

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	2.44	2.21	1	411	31	275	334	20,559	13,213	29,240
Feb.	3.49	2.23	5	1,900	1	282	342	18,970	11,538	25,414
Mar.	2.44	2.11	11	411	28	238	302	18,575	11,704	22,124
Apr.	2.23	2.05	27	282	119	218	246	14,654	11,624	21,960
May	3.20	2.08	15	1,340	15	228	287	17,623	16,158	46,055
June	2.83	2.29	26	802	1	305	522	31,087	13,851	37,856
July	2.73	2.40	18	686	31	380	540	33,221	16,535	76,891
Aug.	4.82	2.11	31	5,120	25	238	367	22,544	20,714	162,055
Sept.	3.01	2.14	15	1,040	29	249	336	19,976	52,903	804,466
Oct.	2.19	2.04	17	267	7	214	246	15,124	25,257	5,118
Nov.	2.20	2.05	1	271	127	218	236	14,017	16,247	113,911
Dec.	2.09	2.00	19	231	114	201	210	12,900	13,948	6,589
	4.82	2.00		5,120		201	330	239,250	226,692	1,087,822
Yearly	Meters			Cubic Meters per Second			Thousands of Cubic Meters			
	1.47	.61		145		5.69	9.35	295,110	279,620	1,341,807
										116,790

\* Discharge measurement made on this day      ! And other days

## 08-4474.20 DEAD MANS CANYON NEAR COMSTOCK, TEXAS

In order to determine storm runoff formerly included with measured flows at a gaging station on the Pecos River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on Dead Mans Canyon.

**DESCRIPTION:** Cableway, control weir, bubbler gage, and digital recorder located on the left bank of the canyon at latitude  $29^{\circ}47'05''$ , longitude  $101^{\circ}19'25''$ , 2.3 miles (3.7 km) upstream from its confluence with the Pecos River, which is 9.5 miles (15.3 km) upstream from the Pecos River confluence with the Rio Grande. The zero of the gage is 1,178.00 feet (359.05 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: March 1968 through 1987.

**REMARKS:** This stream is normally dry, its flow being confined to periods of storm runoff from its 88 square miles (228 km<sup>2</sup>) of watershed area. Only the days of flow are shown below.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 37,800 second-feet (1,070 m<sup>3</sup>/sec) on September 17, 1974 with a gage height of 12.78 feet (3.90 m). Maximum volumes: Monthly, 29,164 acre-feet (35,974,000 m<sup>3</sup>) in September 1974; yearly, 30,527 acre-feet (37,655,000 m<sup>3</sup>) in 1974.

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	5,850	(166)	Sept. 18, 1974	Min.
Monthly:	Max.	490	(13.9)	Sept. 1974	Min.
Yearly:	Max.	42.2	(1.20)	1974	Min. see REMARKS

## MEAN DAILY DISCHARGE IN SECOND-FEET 1987

## ANNUAL SUMMARY

Month and Day				
May 18	.3	June 5	16.0	
		6	1.0	

Month	Day	Maximum Gage and Discharge		Total Acre-Feet
		Feet	Second-Feet	
May	18	1.12	13.6	.6
June	5	1.58	207	33.7
		1.58	207	34.3
Yearly			Cubic Meters per Second	Thousands of Cubic Meters
		.48	5.86	42.3

## 08-4494.00 DEVILS RIVER AT PAFFORD CROSSING NEAR COMSTOCK, TEXAS

**DESCRIPTION:** Concrete control wall with rectangular notch opening of 900 second-foot (25.5 m<sup>3</sup>/sec) capacity, cableway, bubbler gage, water-stage recorders (graphic & digital), and binary decimal transmitter located on the left bank at latitude 29°40'35", longitude 101°00'00", about 11.5 miles (18.5 km) east of Comstock, Val Verde County, Texas, and 25.5 river miles (41.0 km) from the confluence with the Rio Grande. The confluence is located at river mile 574.6 (924.7 km), 0.7 river mile (1.1 km) upstream from Amistad Dam. The zero of the gage is 1,131.88 feet (345.00 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 29 discharge measurements during the year, 12 by the United States Section and 17 by the Mexican Section of the Commission, a stable rating curve based on meter measurements, and a continuous record of gage heights. Records available: 1960 through 1987. Records are also available from May 1900 through March 1914 for a station 23.8 river miles (38.3 km) downstream; from December 1923 through September 1932 for a station 22.8 river miles (36.7 km) downstream; from September 2, 1932 through August 1957 for a station 21.0 river miles (33.8 km) downstream; from August 7, 1954 through January 1958 for a station 5.4 river miles (8.7 km) upstream; and from August 1954 through May 31, 1968 for a station at the mouth 24.7 river miles (39.8 km) downstream.

**REMARKS:** At this station the flow of this spring-fed stream is very uniform during periods of dry weather and is not modified by diversions or storage. The transmitter relays gage height data upon interrogation from the Amistad Dam hydro-graphic office of the United States Section of the Commission. Transmission is via radio.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 250,000 second-feet (7,080 m<sup>3</sup>/sec) on September 18, 1974 with a gage height of 19.82 feet (6.04 m). Min. 48.6 second-feet (1.38 m<sup>3</sup>/sec) on August 20, 1969.

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 123,000 (3,480)	Sept. 18, 1974	Min. 53.7 (1.52)	August 20, 1969
Monthly:	Max. 8,460 (240)	Sept. 1974	Min. 64.3 (1.82)	August 1964
Yearly:	Max. 977 (27.7)	1974	Min. 99.9 (2.83)	1968

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	454	379	376	366	291	1,140	449	384	494	328	364	363
2	445	375	380	363	298	1,310	449	384	470	397	363	361
3	440	375	386	370	303	1,060	443	382	455	396	362	360
4	437	372	384	369	335	619	437	379	438	391	364	358
5	434	920	381	392	310	805	437	380	429	391	367	356
6	440	1,540	375	338	305	1,100	437	378	434	391	363	355
7	443	633	370	315	296	654	443	375	430	389	363	352
8	441	514	369	311	295	613	445	375	425	386	439	350
9	435	474	370	309	288	592	444	376	419	380	375	348
10	429	456	370	305	290	625	440	380	409	383	367	350
11	425	449	382	301	284	612	440	380	403	389	370	351
12	425	439	382	312	287	596	442	380	400	391	374	354
13	419	430	372	308	279	749	444	382	397	386	379	354
14	416	427	371	308	276	946	448	380	396	382	375	341
15	416	410	373	304	286	624	456	378	402	384	375	350
16	414	409	377	293	281	533	473	380	414	380	365	349
17	408	366	295	276	512	485	376	412	380	366	351	351
18	403	405	362	296	311	489	452	370	408	380	361	361
19	406	403	359	297	347	485	437	373	405	383	361	396
20	408	406	358	318	318	482	440	369	408	375	364	366
21	411	397	360	351	303	487	418	368	405	373	361	353
22	408	397	358	338	301	488	412	374	400	370	366	350
23	399	395	344	319	305	476	408	379	397	368	367	350
24	397	421	350	318	305	472	410	375	397	377	367	349
25	396	399	350	307	309	161	403	371	397	392	365	339
26	397	393	357	305	304	169	403	379	395	394	365	337
27	391	386	355	291	309	159	407	404	396	379	362	346
28	391	387	352	291	306	154	412	783	389	373	364	342
29	391		344	293	334	187	402	478	467	372	365	340
30	385		359	287	324	457	396	464	423	375	365	339
31	374		365	398	392	552	392	552	364	392	365	341
<b>Sum</b>		13,399		9,570		19,256		12,488		11,869		10,912
	12,887		11,357		9,454		13,404		12,514		11,063	

## Current Year 1987

## Period 1960-1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low				
Jan.	2.14	1.98	1	455	31	364	416	25,561	15,253
Feb.	3.79	1.98	5	4,030	127	364	479	26,577	13,123
Mar.	2.07	1.89	16	415	23	319	366	22,526	13,036
Apr.	2.44	1.80	5	625	11	276	319	18,982	13,706
May	2.16	1.78	31	467	15	267	305	18,752	15,061
June	3.41	2.07	1	2,550	1	415	642	38,194	18,408
July	2.37	2.02	16	590	31	386	432	26,586	14,328
Aug.	2.84	1.97	28	1,150	21	359	403	24,770	20,311
Sept.	2.35	2.02	29	580	10	386	417	39,232	186,522
Oct.	2.07	1.97	25	414	31	359	383	24,821	408,908
Nov.	2.37	1.93	6	590	18	338	369	44,539	503,506
Dec.	2.08	1.88	19	420	14	313	352	21,622	33,013
	3.79	1.78		4,030		267	406	293,898	258,162
<b>Yearly</b>	<b>Meters</b>		<b>Cubic Meters per Second</b>		<b>Thousands of Cubic Meters</b>				
	1.16	.54	114	7.56	11.5	362,517	318,438	872,184	89,420

\* Discharge measurement made on this day ! And other days

## 08-4494.40 BIG SATAN CREEK NEAR COMSTOCK, TEXAS

In order to determine storm runoff formerly included with measured flows at a gaging station on the Devils River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on Big Satan Creek.

**DESCRIPTION:** Cableway, control weir, bubbler gage, and digital recorder located on the right bank of the creek at latitude 29° 39'50", longitude 100° 57'50", 1.1 miles (1.8 km) upstream from its confluence with the Devils River, which is 21.1 miles (34.1 km) upstream from the Devils River confluence with the Rio Grande. The zero of the gage is 1,134.00 feet (345.64 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: May 1968 through 1987.

**REMARKS:** This creek is normally dry, its flow being confined to periods of storm runoff from its 42 square miles (109 km<sup>2</sup>) of watershed area. Only the days of flow are shown below.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 56,100 second-feet (1,590 m<sup>3</sup>/sec) on August 15, 1971 with a gage height of 12.31 feet (3.75 m). Maximum volumes: Monthly, 12,204 acre-feet (15,054,000 m<sup>3</sup>) in August 1971; yearly 12,525 acre-feet (15,450,000 m<sup>3</sup>) in 1971.

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 4,480 (127)	Aug. 15, 1971	Min.	
Monthly:	Max. 198 (5.61)	Aug. 1971	Min.	see REMARKS
Yearly:	Max. 17.3 (0.49)	1971	Min.	

## MEAN DAILY DISCHARGE IN SECOND-FEET 1987

Month and Day			
June 6	3.6		
June 7	0.1		

## ANNUAL SUMMARY

Month	Maximum Gage and Discharge			Total Acre-Feet
	Day	Feet	Second-Feet	
June	6	1.10	7.2	7.3
		1.10	7.2	7.3
Yearly		Meters	Cubic Meters per Second	Thousands of Cubic Meters
		0.34	0.20	9.00

## 08-4494.80 ROUGH CANYON NEAR DEL RIO, TEXAS

In order to determine storm runoff formerly included with measured flows at a gaging station on the Devils River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on Rough Canyon.

**DESCRIPTION:** Cableway, control weir, bubbler gage, and digital recorder located on the right bank at latitude 29° 34'40", longitude 100° 56'00", 3.9 miles (6.3 km) upstream from its confluence with the Devils River, which is 11.1 miles (17.9 km) upstream from the Devils River confluence with the Rio Grande. The zero of the gage is 1,129.00 feet (344.12 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: January 1968 through 1987.

**REMARKS:** This stream is normally dry, its flow being confined to periods of storm runoff from its 24 square miles (62.2 km<sup>2</sup>) of watershed area. Only the days of flow are shown below.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 7,040 second-feet (199 m<sup>3</sup>/sec) on August 12, 1972 with a gage height of 6.80 feet (2.07 m). Maximum volumes: Monthly, 8,230 acre-feet (10,152,000 m<sup>3</sup>) in August 1971; yearly 8,232.2 acre-feet (10,154,000 m<sup>3</sup>) in 1971.

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 2,140 (60.6)	Aug. 16, 1971	Min.	
Monthly:	Max. 134 (3.79)	Aug. 1971	Min.	see REMARKS
Yearly:	Max. 11.4 (0.32)	1971	Min.	

## MEAN DAILY DISCHARGE IN SECOND-FEET 1987

Month and Day			
June 5	31.5	Jul 17	13.6

## ANNUAL SUMMARY

Month	Maximum Gage and Discharge			Total Acre-Feet
	Day	Feet	Second-Feet	
June	6	1.74	296	170
	17		13.6	27.0
Yearly		1.74	296	197
		Meters	Cubic Meters per Second	Thousands of Cubic Meters
		.53	8.4	243

## 08-4494.85 NORTH FORK SAN PEDRO CREEK NEAR DEL RIO, TEXAS

In order to determine storm runoff formerly included with measured flows at a gaging station on the Devils River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on the north fork of San Pedro Creek.

**DESCRIPTION:** Cableway, control weir, bubbler gage, and digital recorder located on the right bank of the creek at latitude 29° 31'20", longitude 100° 53'00", 3 miles (4.8 km) upstream from its confluence with the Middle Fork Branch, which is 6.3 miles (10.1 km) upstream from its confluence with Devils River which itself is 4.5 river miles (7.2 km) above Devils River confluence with the Rio Grande. The zero of the gage is 1,126.92 feet (343.49 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: January 1968 through 1987.

**REMARKS:** This creek is normally dry, its flow being confined to periods of storm runoff from its 17 square miles (44 km<sup>2</sup>) of watershed area. Only the days of flow are shown below.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 5,070 second-feet (144 m<sup>3</sup>/sec) on August 12, 1972 with a gage height of 8.44 feet (2.57 m). Maximum volumes: Monthly, 3,403 acre-feet (4,198,000 m<sup>3</sup>) in October 1969; yearly, 4,061.7 acre-feet (5,010,000 m<sup>3</sup>) in 1969.

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	1,240	(35.1)	Oct. 4, 1969	Min.
Monthly:	Max.	55.3	(1.57)	Oct. 1969	Min. see REMARKS
Yearly:	Max.	5.6	(0.16)	1969	Min.

## MEAN DAILY DISCHARGE IN SECOND-FEET 1987

## ANNUAL SUMMARY

Month and Day		Maximum Gage and Discharge			Total Acre-Feet	
		Month	Day	Feet		
Jun. 6	10.8	Jun.	6	1.33	48.2	32.9
Jun. 7	5.8			1.33	48.2	32.9
		Yearly		Meters	Cubic Meters per Second	Thousands of Cubic Meters
				.41	1.37	40.6

## 08-4494.90 MIDDLE FORK SAN PEDRO CREEK NEAR DEL RIO, TEXAS

In order to determine storm runoff formerly included with measured flows at a gaging station on the Devils River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on the middle fork of San Pedro Creek.

**DESCRIPTION:** Cableway, control weir, bubbler gage, and digital recorder located on the right bank of the creek at latitude 29° 29'30", longitude 100° 52'50", 3.2 miles (5.1 km) upstream from its confluence with the North Fork Branch, which is 6.3 miles (10.1 km) above the confluence with Devils River, which itself is 4.5 river miles (7.2 km) above the Devils River confluence with the Rio Grande. The zero of the gage is 1,137.02 feet (346.56 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: December 1967 through 1987.

**REMARKS:** This creek is normally dry, its flow being confined to periods of storm runoff from its 12 square miles (31 km<sup>2</sup>) of watershed area. Only the days of flow are shown below.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 10,200 second-feet (289 m<sup>3</sup>/sec) on July 17, 1975 with a gage height of 5.84 feet (1.78 m). Maximum volumes: Monthly, 3,726 acre-feet (4,596,000 m<sup>3</sup>) in July 1975; yearly, 3,726 acre-feet (4,596,000 m<sup>3</sup>) in 1975.

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	1,390	(39.4)	July 17, 1975	Min.
Monthly:	Max.	60.6	(1.72)	July 1975	Min. see REMARKS
Yearly:	Max.	5.1	(0.14)	1975	Min.

## MEAN DAILY DISCHARGE IN SECOND-FEET 1987

## ANNUAL SUMMARY

Month and Day		Maximum Gage and Discharge			Total Acre-Feet			
		Month	Day	Feet				
June 1	0	June 11	24.2	June 21 16.3	July 1 10.7	June 5 1.50	150	1,233
2	0		12	22.2	22 13.9	1	.98	54.9
3	0		13	22.4	23 12.8			
4	0		14	20.7	24 13.7			
5	40.5		15	20.7	25 11.1	5	1.2	
6	90.1		16	21.8	26 11.4	6	.1	
7	71.8		17	20.6	27 8.9			
8	36.5		18	19.3	28 9.1			
9	31.4		19	17.6	29 9.9			
10	26.9		20	17.8	30 10.0			
		Yearly		Meters	Cubic Meters per Second			
				.46	4.25			1,589

## 08-4495.90 EVANS CREEK NEAR COMSTOCK, TEXAS

In order to determine storm runoff formerly included with measured flows at a gaging station on the Devils River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on Evans Creek.

**DESCRIPTION:** Cableway, control weir, bubbler gage, and digital recorder located on the left bank of the creek at latitude  $29^{\circ}32'15''$ , longitude  $101^{\circ}06'10''$ , 11.0 miles (17.7 km) upstream from its confluence with the Devils River, which is 3.2 miles (5.1 km) upstream from the Devils River confluence with the Rio Grande. The zero of the gage is 1,162.54 feet (354.34 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: December 1967 through 1987.

**REMARKS:** This creek is normally dry, its flow being confined to periods of storm runoff from its 74 square miles (192 km<sup>2</sup>) of watershed area. Only the days of flow are shown below.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 17,400 second-feet (493 m<sup>3</sup>/sec) on June 2, 1971 with a gage height of 5.99 feet (1.83 m). Maximum volumes: Monthly, 9,281 acre-feet (11,448,000 m<sup>3</sup>) in August 1971; yearly, 14,404 acre-feet (17,767,000 m<sup>3</sup>) in 1971.

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	3,940	(112)	Aug. 15, 1971	Min.
Monthly:	Max.	151	(5.28)	Aug. 1971	Min. see REMARKS
Yearly:	Max.	19.9	(0.56)	1971	Min.

## MEAN DAILY DISCHARGE IN SECOND-FEET 1987

Month and Day			
			No flow during 1987

## ANNUAL SUMMARY

Month	Maximum Gage and Discharge			Total Acre-Feet
	Day	Feet	Second-Feet	
Yearly				
		Meters	Cubic Meters per Second	Thousands of Cubic Meters

## 08-4508.05 CARMINA SPRINGS NEAR CD. ACUNA, COAHUILA

**DESCRIPTION:** Cipolletti weir of 70.6 second-foot (2.0 m<sup>3</sup>/sec) capacity and staff gage located on a creek that runs almost parallel to Amistad Dam, about 130 feet (40 m) from the confluence with the Rio Grande, at latitude 29°26'50", longitude 101°03'35", and about 11.0 miles (17.7 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 573.7 (923.2 km), 0.2 river mile (400 m) downstream from Amistad Dam and 12.6 river miles (20.3 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1987.

**REMARKS:** At least six separate springs have emerged on the watershed of this small creek since operation of Amistad Dam began in May 1968. Prior to this time, flow in this creek was exclusively from storm runoff. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below. On September 24, 1971, a flood destroyed part of the weir.

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	55.8	55.1	54.4	55.1	56.5	56.5	50.9	52.3	59.3	59.3	58.3	57.2
2	55.8	55.1	54.7	55.1	56.5	56.5	53.3	51.9	59.3	59.0	58.3	57.2
3	55.8	55.1	54.4	55.1	56.5	65.7	53.0	51.6	58.3	59.0	58.3	57.2
4	55.8	55.1	55.1	55.1	56.5	64.3	53.0	52.3	57.2	58.6	58.3	57.2
5	55.8	55.1	55.1	55.1	56.5	63.2	53.7	51.9	56.2	58.6	58.3	57.2
6	55.8	55.1	55.1	55.1	56.9	61.8	53.0	52.6	55.1	58.3	58.3	57.2
7	55.8	54.4	55.1	55.1	57.2	60.4	53.7	53.3	54.0	58.3	58.3	57.2
8	55.8	53.7	55.1	55.1	57.9	59.0	53.0	54.0	53.0	58.3	58.6	57.2
9	55.1	53.3	55.1	55.1	58.3	57.9	52.6	54.4	51.9	58.3	58.3	57.2
10	55.1	54.4	55.8	55.1	58.6	56.5	52.6	55.1	52.6	58.3	57.2	57.2
11	55.1	54.4	55.8	55.1	59.0	55.8	52.6	55.8	53.0	58.3	57.2	57.2
12	55.1	54.4	55.8	55.1	59.7	54.7	52.6	56.5	53.7	58.3	57.2	57.2
13	55.1	54.4	56.2	55.1	*60.0	54.0	52.6	56.5	54.4	58.3	57.2	57.2
14	55.1	54.4	56.2	55.1	60.0	53.3	52.3	56.5	54.7	*58.3	57.2	57.2
15	55.1	54.4	56.2	55.1	60.4	52.6	52.3	56.5	55.4	58.3	57.2	57.2
16	55.1	54.4	56.2	55.1	60.4	51.6	53.0	56.5	55.8	58.3	57.2	57.2
17	55.1	54.4	56.5	55.1	60.4	50.9	53.0	56.5	56.5	58.3	57.2	57.2
18	54.0	54.4	56.5	55.4	60.4	50.9	52.6	56.5	56.5	58.3	57.2	57.2
19	54.7	54.7	56.2	55.8	60.7	51.6	52.6	56.5	56.5	58.3	57.2	57.2
20	54.4	54.7	56.2	55.8	60.7	51.6	52.3	56.5	56.5	58.3	57.2	57.2
21	54.4	54.7	55.8	56.5	60.0	51.6	52.3	56.5	56.5	58.3	57.2	57.2
22	*54.7	54.7	55.8	*56.5	59.7	51.6	52.6	56.5	56.2	58.3	57.2	57.2
23	54.7	55.1	55.4	56.5	59.0	51.6	53.0	56.5	56.5	58.3	57.2	57.2
24	54.7	*55.1	55.4	56.5	58.3	51.6	53.0	56.5	56.9	58.3	57.2	57.2
25	54.7	55.1	*55.1	56.5	57.6	51.6	53.0	56.5	57.2	58.3	57.2	56.5
26	55.1	55.1	55.1	56.5	57.2	51.2	53.0	56.5	57.6	58.3	57.2	56.5
27	55.1	55.1	55.1	56.5	57.2	51.2	53.3	57.2	58.3	58.3	57.2	56.5
28	55.1	54.4	55.1	56.5	57.5	51.2	53.0	58.3	58.6	58.3	57.2	56.5
29	55.1		55.1	56.5	57.5	51.2	52.6	58.6	59.0	58.3	57.2	56.5
30	55.1		55.1	56.5	57.5	50.9	52.3	59.3	59.3	58.3	57.2	56.5
31	55.1		55.1	57.2		52.3	59.3			58.3		56.5
<b>Sum</b>		1,530.3		1,669.4		1,642.5		1,725.4		1,810.3		1,768.3
	1,709.2		1,719.8		1,808.1		1,635.1		1,686.0		1,726.2	

## Current Year 1987

## Period 1969-1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Low		Average	Maximum	Minimum		
Jan.	1.38	1.31	! 1 0	55.8	18	53.3	55.1	3,390	2,752	4,041	
Feb.	1.35	1.31	! 1 0	55.1	9 0	53.3	54.7	3,035	2,481	3,405	
Mar.	1.38	1.31	110	57.2	! 1 0	54.4	55.4	3,411	2,700	3,621	
Apr.	1.38	1.35	121 0	56.5	! 1 0	55.1	55.8	3,311	2,560	3,514	
May	1.44	1.38	19 0	60.7	! 1 0	56.5	58.3	3,587	2,584	3,691	
June	1.54	1.25	3 0	65.7	117 0	50.9	54.7	3,257	2,520	3,572	
July	1.31	1.25	! 5 0	53.7	1 0	50.9	52.6	3,242	2,585	3,691	
Aug.	1.41	1.25	130 0	59.3	! 3 0	50.9	55.8	3,423	2,650	3,533	
Sept.	1.41	1.28	! 1 0	59.3	9 0	51.9	56.2	3,344	2,624	3,377	
Oct.	1.41	1.41	! 1 0	59.3	! 6 0	58.3	58.3	3,589	2,867	3,816	
Nov.	1.41	1.38	6 0	59.3	! 10 0	57.2	57.6	3,424	2,807	3,685	
Dec.	1.38	1.38	! 1 0	57.2	125 0	56.5	57.2	3,508	2,933	3,906	
<b>Yearly</b>	1.54	1.25		65.7		50.9	55.8	40,521	32,072	41,290	9,080
	<b>Meters</b>			<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>				
	0.47	0.38		1.86		1.44	1.58	49,982	38,984	50,932	11,201

\* Discharge measurement made on this day

① Mean daily

! And other days

## LOURDES AND HILDA SPRINGS NEAR CD. ACUNA, COAHUILA

## 08-4508.20 LOURDES SPRING

DESCRIPTION: Rectangular sharp-crested weir of 28.8 second-foot (815 l/sec) capacity and staff gage located at latitude  $29^{\circ} 26' 35''$ , longitude  $101^{\circ} 03' 30''$ , at the base of the high bank of the Rio Grande, and about 11.1 miles (17.9 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 573.2 (922.5 km), 12.2 river miles (19.6 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 926.28 feet (282.33 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1987.

REMARKS: This spring emerged since operation of Amistad Dam began in May 1968. All storm water from surface runoff passing this station is deducted. The daily flow throughout the year ranged from 1.8 (0.05) to 2.5 second-feet (0.07 m<sup>3</sup>/sec) and averaged 2.1 second-feet (0.06 m<sup>3</sup>/sec). The volume for the year amounted to 1,558 acre-feet (1,922,000 m<sup>3</sup>).

## 08-4508.30 HILDA SPRING

DESCRIPTION: Rectangular sharp-crested weir of 53.0 second-foot (1.50 m<sup>3</sup>/sec) capacity and staff gage located at latitude  $29^{\circ} 26' 20''$ , longitude  $101^{\circ} 03' 35''$ , about 328 feet (100 m) from the confluence with the Rio Grande and about 11.0 miles (17.7 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 572.8 (921.8 km), 11.8 river miles (19.0 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 908.14 feet (276.80 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1987.

REMARKS: This spring emerged since operation of Amistad Dam began in May 1968. All storm water from surface runoff passing this station is deducted. The daily flow throughout the year ranged from 2.1 (0.05) to 3.2 second-feet (0.09 m<sup>3</sup>/sec) and averaged 2.5 second-feet (0.07 m<sup>3</sup>/sec). The volume for the year amounted to 1,798 acre-feet (2,218,000 m<sup>3</sup>).

In order to determine what effect storage in Amistad Reservoir has on the flow of various Mexican springs in the vicinity of Amistad Dam, gaging stations were established in November 1961 at Ernestina and Rosita Springs. The station at Rosita Spring was discontinued in June 1975. The station at Ernestina was discontinued in March 1981.

08-4509.00 RIO GRANDE BELOW AMISTAD DAM NEAR  
CD. ACUNA, COAHUILA AND DEL RIO, TEXAS

**DESCRIPTION:** Cableway, gravity well, concrete control weir, and water-stage recorders (graphic and digital), and binary decimal transmitters located on the left bank at latitude 25°30'N, longitude 101°02'25"W, and river mile 571.8 (920.3 km), 2.2 river miles (3.4 km) downstream from Amistad Dam and 10.8 river miles (17.4 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 898.94 feet (274.00 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 40 discharge measurements during the year, 38 by the Mexican Section and 6 by the United States Section of the Commission, and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: September 1954 through 1987. Records are also available from May 1900 through April 1915 for a station 1.9 miles (3 km) upstream; from December 1919 through March 1920 for a station 1.7 miles (3 km) downstream near McKee's Switch; from July 2, 1941 through August 1954 and October 1960 through 1967 for a station at the international highway bridge; and from December 1923 through July 2, 1941, and 1968 through 1987 for a station approximately 10.6 miles (17.0 km) downstream.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. On May 31, 1968 Amistad Dam started impounding water. After this day, flow at this station is controlled largely by releases from Amistad Reservoir, 2.1 river miles (3.3 km) upstream. The transmitter relays gage height data upon interrogation by telephone via private line to the Amistad office.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 1,158,000 second-feet (32,800 m<sup>3</sup>/sec) on June 28, 1954, determined by slope-area computation, with a gage height of 55.72 feet (16.98 m) at the old station site 500 feet (152 m) downstream. This is the greatest rate of discharge recorded at any point on the Rio Grande. Max. since Amistad Dam, 62,200 second-feet (1,760 m<sup>3</sup>/sec) on Sept. 21, 1974. Min. 22.2 second-feet (0.63 m<sup>3</sup>/sec) on February 14, 1969 with a gage height of 1.08 feet (0.33 m).

Average Flow in Second-Feet (Cubic Meters per Second)

Daily: Max.	61,100 (1,730)	Sept. 22, 1974	Min. 46.6 (1.32)	April 13, 1971
Monthly: Max.	21,500 (609)	Sept. 1974	Min. 60.7 (1.72)	Oct. 1971
Yearly: Max.	4,910 (139)	1974	Min. 576 (16.3)	1972

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,070	3,500	3,470	2,420	1,430	1,370	4,520	4,630	4,590	2,920	2,010	350
2	2,050	3,430	3,470	2,330	1,450	1,380	4,590	4,590	4,520	2,500	2,010	350
3	2,020	3,410	3,510	2,370	1,360	1,380	4,520	4,590	4,910	2,050	2,010	396
4	2,050	3,400	3,290	2,370	1,800	1,360	4,520	4,660	4,480	2,050	2,010	306
5	2,030	3,410	3,460	2,370	1,640	1,430	4,520	4,630	4,590	2,050	1,990	263
6	2,020	3,380	3,440	2,370	1,760	1,350	4,520	4,590	4,480	3,080	2,030	263
7	2,020	3,390	3,430	1,490	1,860	1,360	4,420	4,590	4,590	3,080	2,110	267
8	2,020	3,390	3,450	1,430 *	1,360	1,390	2,320	4,560	4,590	3,040	2,080	270
9	2,020	3,390	3,390	1,570	1,340	2,040	2,410	4,520	4,480 *	3,070	2,080	311 *
10	2,050	3,440 *	3,420	2,250	1,320	3,220 *	2,400	4,560	4,560	3,070	2,080	360
11	2,050	3,490	3,420	2,250	1,390	3,320	2,380	4,520	4,480	3,040	2,050	353
12	2,050	3,510	3,320	2,280	1,320	3,320	2,390	4,480	4,060	3,100	2,120	350
13	2,050	3,460	3,460	2,250	1,360	3,340	2,430	4,480	4,030	3,200	2,140	350
14	2,050	3,470	3,400	2,280	1,350	3,340	2,430	4,560	4,100	2,590	2,050	367
15	2,050	3,470	3,400	1,390	1,340	3,410	2,510	4,590	2,420	3,040	2,050	950
16	4,560	3,530	3,460	1,430	1,320	4,560	2,370	4,590	2,190	2,020 *	2,050	752 *
17	4,660	3,390	3,400	1,440	1,350	4,590	2,400	4,340	2,010	2,010	2,050	809
18	4,630	3,460	3,370	1,410	1,360	4,590	4,100	4,200	2,040 *	2,010	1,580 *	784
19	4,630	3,450	3,410	1,420	1,370	4,590	4,240	4,200 *	2,090	1,510	448	816
20	4,660	3,450	3,440	1,430	1,450	4,630	4,450	4,130	2,010	1,520	410	809
21	4,660	3,430	3,440	1,430	1,390	4,590	4,630	4,100	2,010	1,570	403	791
22	4,660	3,430	3,410	1,420	1,390	4,450	4,590	4,100	2,010	1,590	406	746
23	4,590	3,460	3,460	1,400	1,390	4,210	4,590	4,060	2,100	1,570	399	795
24	4,590	3,430	3,410	1,400	1,390	4,450	4,660	2,470	2,100	1,600	367	766
25	4,630	3,480	3,370	1,450	2,030	4,480	4,730	2,330	2,400	1,560	350	759
26	4,660	3,470	3,440	1,430	1,440	4,380	4,700	2,330	2,090	1,530	350	766
27	4,700	3,460	3,410	1,400	1,370	4,480	4,660	2,330	2,050	1,510	350	766
28	4,700	3,450	3,400	1,420	1,360	4,480	4,660	2,360	2,060	1,540	350	763
29	4,660	3,390	3,420	1,390	1,390	4,520	4,520	4,380	2,100	1,540	350	780
30	4,660	3,390	3,380	1,380	1,360	4,560	4,700	4,660	2,070	1,480	350	759
31	4,660	3,380	3,380	1,360	1,360	4,660	4,660	4,660	1,990	1,990	766	

<b>Sum</b>	96,430	52,700	100,600	127,790	68,430	17,932
	104,910	105,910	44,800	117,540	96,210	41,033

**Current Year 1987**

**Period 1968-1987**

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Low		Average	Maximum	Minimum		
Jan.	2.53	1.61	23	4,730	3	1,970	3,380	208,035	.91,265	209,814	5,318
Feb.	2.56	1.77	110	4,880	1	2,370	3,440	191,287	121,510	467,202	12,467
Mar.	2.56	.39	1	4,890	31	118	3,420	210,115	146,222	396,457	7,271
Apr.	2.49	.36	1	4,660	1	9	108	1,760	104,487	124,148	383,554
May	2.33	.36	7	4,100	18	97.1	1,840	88,894	206,920	539,699	24,137
June	3.05	.36	23	6,850	4	108	3,350	199,552	154,455	327,602	16,418
July	2.66	.39	30	5,260	7	118	3,780	233,132	134,940	366,470	23,182
Aug.	2.56	1.74	14	4,910	124	2,330	4,130	253,473	158,378	662,215	15,589
Sept.	3.05	1.61	3	6,780	115	2,010	3,210	190,831	195,567	1,280,079	17,606
Oct.	3.08	.36	13	6,990	119	108	2,210	135,692	150,464	812,596	3,134
Nov.	1.80	.62	13	2,500	25	303	1,370	81,358	96,465	502,295	4,593
Dec.	2.26	.29	15	3,810	17	69.2	579	35,569	78,711	216,286	4,859
	3.08	.29		6,990		69.2	2,670	1,932,425	1,659,145	3,566,065	416,789
<b>Yearly</b>	<b>Meters</b>		<b>Cubic Meters per Second</b>		<b>Thousands of Cubic Meters</b>						
	0.94	0.09		198		1.96	75.6	2,383,621	2,039,533	4,398,694	514,104

\* Discharge measurement made on this day.

! And other days

## 08-4509.04 SPRING M-15 NEAR CD. ACUNA, COAHUILA

**DESCRIPTION:** Rectangular sharp-crested weir of 8.1 second-foot (230 l/sec) capacity and staff gage located at latitude 29°25'20", longitude 101°02'40", about 1,300 feet (400 m) from the confluence with the Rio Grande and about 9.4 miles (15.1 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 571.3 (919.4 km), 10.3 river miles (16.6 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 925.13 feet (281.98 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1987.

**REMARKS:** This spring emerged since operation of Amistad Dam began in May 1968. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below.

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.7	0.7	0.7	0.7	1.1	1.4	1.1	0.7	1.1	1.1	1.1	1.1
2	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
3	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
4	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
5	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
6	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
7	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
8	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
9	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
10	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
11	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
12	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
13	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
14	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
15	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
16	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
17	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
18	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
19	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
20	.7	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1
21	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1	1.1
22	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1	1.1
23	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1	1.1
24	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1	1.1
25	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1	1.1
26	.7	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1	1.1
27	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1	1.1	1.1
28	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1	1.1	1.1
29	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1	1.1	1.1
30	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1	1.1	1.1
31	.7	.7	1.1	1.4	1.1	.7	1.1	1.1	1.1	1.1	1.1	1.1
<b>Sum</b>	19.6	25.4	38.1	26.5	34.1	34.1						
	21.7	21.7	37.4	28.9	33.0	33.0						

## Current Year 1987

## Period 1969-1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	High	Low			Average	Maximum	Minimum
	Day	Day	Day						
Jan.	0.30	0.30	1.1	0.7	1.1	0.7	43.5	77.6	131
Feb.	.30	.30	1.1	.7	1.1	.7	39.2	67.9	123
Mar.	.30	.30	1.1	.7	1.1	.7	43.5	67.7	122
Apr.	.30	.30	1.20	1.1	1.1	.7	49.7	63.9	105
May	.46	.30	1.21	1.0	1.1	1.1	72.9	68.5	109
June	.46	.30	1.1	1.0	1.1	1.1	74.9	61.4	121
July	.30	.30	1.1	1.1	1.1	.7	56.0	62.3	106
Aug.	.30	.30	1.20	1.1	1.1	.7	51.8	61.7	122
Sept.	.33	.36	1.1	1.1	1.1	1.1	63.1	67.6	165
Oct.	.36	.36	1.1	1.1	1.1	1.1	65.2	79.8	326
Nov.	.33	.33	1.1	1.1	1.1	1.1	63.1	75.3	202
Dec.	.33	.33	1.1	1.1	1.1	1.1	65.2	74.9	131
	0.46	0.30		1.4		0.7	688	829	1,362
<b>Yearly</b>	<b>Meters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>		
	0.14	0.09	0.04	0.02	0.03		849	1,023	1,679

0 Mean daily

! And other days

08-4509.05 ARROYO DE LOS JABONCILLOS NEAR CD. ACUNA, COAHUILA

**DESCRIPTION:** Cipolletti weir of 70.6 second-foot (2 m<sup>3</sup>/sec) capacity and staff gage located at latitude 29°24'25", longitude 101°02'20", about 660 feet (200 m) from the confluence with the Rio Grande, and about 8.6 miles (13.8 km) north-west of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 570.5 (918.2 km), 9.5 river miles (15.3 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1987.

**REMARKS:** At least 9 separate springs have emerged along this creek since operation of Amistad Dam began in May 1968. Prior to this time, flow in this creek was exclusively from storm runoff. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below.

### Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	52.3	51.9	52.3	50.9	51.6	66.4	57.2	58.3	52.6	57.6	55.8	57.6
2	52.3	51.6	51.9	50.5	52.3	68.9	56.9	57.6	53.0	57.6	56.2	57.9
3	52.3	51.6	51.2	50.5	51.9	71.3	56.5	57.2	53.3	57.2	56.2	57.9
4	52.3	50.9	50.9	50.5	49.8	69.9	56.2	56.9	54.0	57.2	56.5	57.9
5	52.3	50.9	50.9	50.5	49.8	68.5	56.2	56.5	54.4	56.9	56.5	57.9
6	52.3	55.1	51.2	50.5	50.5	67.1	55.8	55.8	55.1	56.9	56.5	57.9
7	52.3	54.7	51.2	50.5	50.9	66.0	55.4	55.4	55.4	56.5	56.5	57.9
8	52.6	54.0	51.6	50.5	50.9	64.6	55.1	54.7	56.2	56.2	56.5	57.9
9	52.6	53.7	51.6	50.5	51.2	63.2	55.1	54.0	56.5	55.8	56.5	57.9
10	52.6	53.3	51.9	50.5	51.6	61.8	54.7	53.3	56.5	55.4	56.5	57.9
11	52.6	53.0	51.9	50.5	51.9	61.1	54.7	53.0	56.9	54.7	56.5	58.3
12	53.0	52.6	51.9	50.5	51.9	60.7	54.7	52.3	57.2	54.4	56.5	58.3
13	53.0	52.3	52.3	50.5	52.3	60.0	54.7	52.3	57.2	54.0	56.9	58.3
14	53.0	51.6	52.3	50.5	50.1	59.7	54.4	52.3	57.2	53.7	56.9	58.3
15	52.6	51.2	52.6	50.5	50.1	59.0	54.4	52.3	57.6	54.0	56.9	58.6
16	52.6	50.9	52.6	51.2	49.4	58.6	54.4	52.3	* 57.9	54.4	56.9	* 58.6
17	52.6	50.5	53.0	51.6	49.4	* 57.9	54.0	52.3	* 57.9	54.7	57.2	58.6
18	52.6	51.2	53.0	52.3	49.1	57.9	54.0	52.3	* 57.6	54.7	* 57.2	59.0
19	52.3	51.6	53.0	52.6	49.8	57.9	54.0	52.3	56.9	55.1	57.2	59.0
20	52.3	52.3	52.6	53.3	52.3	57.9	54.0	52.3	56.5	55.4	56.9	59.0
21	52.3	53.0	52.6	53.7	52.6	57.9	* 53.7	51.9	56.2	* 55.8	56.9	59.0
22	52.3	53.7	52.6	54.4	53.0	57.9	* 53.7	51.9	55.4	55.8	56.9	59.3
23	52.3	54.0	52.6	54.0	53.3	57.9	* 51.4	51.6	55.1	55.4	56.9	59.3
24	52.3	54.7	52.3	54.0	53.3	57.9	* 55.4	51.6	55.4	56.5	56.9	59.3
25	52.3	54.4	52.3	53.7	53.7	57.9	* 56.2	51.2	55.8	55.1	56.5	59.7
26	52.3	53.7	51.9	53.7	54.0	57.6	56.9	51.2	56.2	55.1	56.9	59.7
27	52.3	53.3	51.9	53.3	* 54.4	57.6	57.6	51.6	56.9	54.7	56.9	60.0
28	52.3	53.0	51.6	53.3	56.9	57.6	58.6	51.6	57.2	54.7	57.2	60.0
29	51.9	51.6	53.0	53.0	59.3	57.6	59.3	51.9	57.6	55.1	57.2	60.4
30	51.9	51.2	53.0	61.8	57.2	59.0	52.3	57.9	55.1	57.6	56.4	60.4
31	51.9	50.9			63.9		58.6	52.6	55.4			
<b>Sum</b>	1,478.2		1,555.0		1,835.5		1,652.8		1,720.0		1,822.2	
	1,624.6		1,611.4		1,633.0		1,725.8		1,683.6		1,702.3	

### Current Year 1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Period 1969-1987		
	High	Low	Day				Average	Maximum	Minimum
			High	Low	Day	Day			
Jan.	1.80	1.77	112	53.0	129	51.9	52.3	3,222	3,364
Feb.	1.84	1.74	5	55.8	17	50.5	52.6	2,932	3,055
Mar.	1.77	1.74	117	53.0	14	50.9	51.9	3,196	3,306
Apr.	1.80	1.74	22	54.4	12	50.5	51.8	3,084	3,137
May	1.80	1.67	31	63.9	18	48.4	52.6	3,239	3,161
June	2.17	1.90	3	71.3	30	57.2	61.1	3,641	2,966
July	1.94	1.80	29	59.3	121	53.7	55.8	3,423	2,999
Aug.	1.87	1.74	1	58.3	125	51.2	53.3	3,278	4,367
Sept.	1.90	1.77	116	57.9	1	52.6	56.2	3,339	3,026
Oct.	1.87	1.80	1	57.6	14	53.7	55.4	3,412	4,321
Nov.	1.87	1.87	30	57.6	1	55.8	56.9	3,376	3,396
Dec.	1.94	1.90	129	60.4	1	57.6	58.6	3,614	4,709
	2.17	1.67		71.3		48.4	54.7	39,756	38,356
<b>Yearly</b>	<b>Meters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>		
	0.66	0.51		2.02		1.37	1.55	49,037	47,314
								63,943	12,152

\* Discharge measurement made on this day

! And other days

08-4509.06 SPRING M-5 NEAR CD. ACUNA, COAHUILA

**DESCRIPTION:** Rectangular, sharp-crested weir of 17.7 second-foot (500 l/sec) capacity and staff gage located at latitude 29° 25' 20", longitude 101° 02' 35", at the base of the high bank of the Rio Grande, and about 9.2 miles (14.8 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 571.1 (919.1 km), 10.1 river miles (16.3 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 932.38 feet (284.19 m) above mean sea level U. S. C. & G. S. datum.

**RECORDS:** Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1987.

**REMARKS:** This spring emerged since operation of Amistad Dam began in May 1968. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below.

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
2	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
3	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
4	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
5	2.5	2.5	2.5	2.5	2.5	2.5	2.1	-	2.1	2.5	2.5	2.5
6	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
7	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
8	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
9	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
10	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
11	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
12	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
13	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
14	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
15	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
16	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
17	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
18	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
19	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
20	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
21	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
22	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
23	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
24	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
25	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5
26	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5	2.5
27	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5	2.5
28	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5	2.5
29	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5	2.5
30	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5	2.5
31	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.5	2.5	2.5	2.5
<b>Sum</b>	70.0	75.0	69.8	65.1	77.5	65.1	65.1	67.0	77.5	77.5	75.0	77.5
	77.5	77.5	77.5	65.1	77.5	65.1	65.1	67.0	77.5	77.5	75.0	77.5

## Current Year 1987

## Period 1969-1987

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	.36	.36	! 1	2.5	! 1	2.5	152	159	195	86.7
Feb.	.36	.36	! 1	2.5	! 1	2.5	137	144	173	78.6
Mar.	.36	.36	! 1	2.5	! 1	2.5	152	155	181	64.9
Apr.	.37	.37	! 1	2.5	! 1	2.5	147	150	178	63.2
May	.36	.36	! 1	2.5	! 1	2.5	152	157	186	64.9
June	.38	.35	! 1	2.5	! 1	2.5	138	148	181	63.2
July	.35	.34	! 1	2.1	! 1	2.1	131	148	173	43.8
Aug.	.34	.34	! 1	2.1	! 1	2.1	131	152	195	43.8
Sept.	.36	.36	! 21	2.5	! 1	2.1	133	150	189	42.2
Oct.	.36	.36	! 1	2.5	! 1	2.5	152	158	195	43.8
Nov.	.36	.36	! 1	2.5	! 1	2.5	147	153	189	63.2
Dec.	.36	.36	! 1	2.5	! 1	2.5	152	157	195	64.9
	.38	.34		2.5		2.1	1,724	1,831	2,148	723
<b>Yearly</b>	<b>Meters</b>			<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>		
	0.12	0.11		0.07		0.06	0.07	2,122	2,259.	2,653

0 Mean daily

! And other days

## 08-4509.10 ARROYO DEL BUEY NEAR CD. ACUNA, COAHUILA

**DESCRIPTION:** Cipolletti weir of 35.3 second-foot ( $1 \text{ m}^3/\text{sec}$ ) capacity, located at latitude  $29^{\circ}24'20''$ , longitude  $101^{\circ}02'25''$ , 0.2 creek mile (300 m) from the confluence with the Rio Grande, and about 8.5 miles (13.7 km) northwest of Cd. Acuna, Coahuila. This stream enters the Rio Grande from the Mexican side at river mile 570.4 (918.0 km), 3.5 river miles (5.6 km) downstream from Amistad Dam and 9.4 river miles (15.2 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: November 1961 through 1987.

**REMARKS:** The flow of this stream is not modified by diversions or storage. Prior to 1969 discharges were based on a continuous record of gage heights and the weir discharge table. Storm flow is deducted and not included in the tabulation below. This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir will have on the flow of this stream. At approximately 0.3 creek mile (0.5 km) upstream from the weir, four springs have emerged since Amistad Reservoir Storage began. Backwater from the Rio Grande will affect the flow of this stream when the flow in the river is approximately 20,000 second-feet (566  $\text{m}^3/\text{sec}$ ).

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.5	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5
2	8.5	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5
3	8.5	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5
4	8.5	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5
5	8.5	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5
6	8.5	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5
7	8.5	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5
8	8.5	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5
9	8.5	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5
10	8.5	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5
11	8.5	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5
12	8.5	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5
13	8.5	8.1	8.1	8.5	8.8	9.2	8.8	8.5	8.8	8.8	8.5	8.5
14	8.5	8.1	8.1	8.5	8.8	9.2	8.8	8.5	8.8	8.8	8.5	8.5
15	8.5	8.1	8.1	8.5	8.8	9.2	8.8	8.5	8.8	8.8	8.5	8.5
16	8.5	8.1	8.1	8.5	8.8	9.2	8.8	8.5	8.8	8.8	8.5	8.5
17	8.5	8.1	8.1	8.5	8.8	9.2	8.8	8.5	8.8	8.8	8.5	8.5
18	8.5	8.1	8.1	8.5	8.8	8.8	8.8	8.5	8.8	8.8	8.5	8.5
19	8.1	8.1	8.5	8.5	8.8	8.8	8.8	8.5	8.8	8.8	8.5	8.1
20	8.1	8.1	8.5	8.5	8.8	8.8	8.8	8.5	8.8	8.8	8.5	8.1
21	8.1	8.1	8.5	8.5	8.8	8.8	8.5	8.8	8.8	8.5	8.5	8.1
22	8.1	8.1	8.5	8.5	8.8	8.8	8.5	8.8	8.8	8.5	8.5	8.1
23	8.1	8.1	8.5	8.5	8.8	8.8	8.5	8.8	8.8	8.5	8.5	8.1
24	8.1	8.1	8.5	8.5	8.8	8.8	8.5	8.8	8.8	8.5	8.5	8.1
25	8.1	8.1	8.5	8.5	8.8	8.8	8.5	8.8	8.8	8.5	8.5	8.1
26	8.1	8.1	8.5	8.5	8.8	8.8	8.5	8.8	8.8	8.5	8.5	8.1
27	8.1	8.1	8.5	8.5	8.8	8.8	8.5	8.8	8.8	8.5	8.5	8.1
28	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5	8.1
29	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5	8.1
30	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5	8.1
31	8.1	8.1	8.5	8.5	9.2	8.8	8.5	8.8	8.8	8.5	8.5	8.1
<b>Sum</b>	<b>226.8</b>		<b>255.0</b>		<b>270.8</b>		<b>270.8</b>		<b>267.1</b>		<b>269.5</b>	
	258.3		256.3		270.8		268.9		264.0		255.0	258.3

## Current Year 1987

## Period 1961-1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High			Day	Average	Maximum	Minimum	
Jan.	0.82	0.82	1 1	8.5	119	8.1	8.5	512	329	528	6.8
Feb.	.82	.82	1 1	8.1	1 1	8.1	8.1	451	297	477	5.4
Mar.	.82	.82	119	8.5	1 1	8.1	8.1	508	324	520	9.3
Apr.	.82	.82	1 1	8.5	1 1	8.5	8.5	504	340	540	6.3
May	.89	.82	128	9.2	1 1	8.5	8.8	538	331	544	10.9
June	.89	.85	1 1	9.2	118	8.8	9.2	538	323	538	6.3
July	.85	.85	1 1	8.8	19	8.5	8.8	533	320	533	6.5
Aug.	.85	.85	120	8.8	1 1	8.5	8.5	529	340	529	6.7
Sept.	.85	.85	1 1	8.8	1 1	8.8	8.8	525	345	525	6.6
Oct.	.85	.85	1 1	8.8	121	8.5	8.8	535	368	544	6.5
Nov.	.85	.85	1 1	8.5	1 1	8.5	8.5	504	335	516	6.3
Dec.	.85	.82	1 1	8.5	119	8.1	8.5	512	341	538	6.5
	0.89	0.82		9.2		8.1	8.5	6,191	3,993	6,191	217
<b>Yearly</b>	<b>Meters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>				
	0.27	0.25		0.26		0.23	0.24	7,636	4,925	7,636	267

0 Mean daily ! And other days

## 08-4511.20 MARIS SPRING NEAR CD. ACUNA, COAHUILA

**DESCRIPTION:** Cipolletti weir of 106 second-foot (3 m<sup>3</sup>/sec) capacity and staff gage located at the spring about 100 feet (30 m) from the right bank of the Rio Grande at latitude 29°24'00", longitude 101°01'40", and about 8 miles (12.9 km) northwest of Cd. Acuna, Coahuila. This spring enters the Rio Grande at river mile 569.9 (917.2 km), 8.9 river miles (14.3 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila and 4.0 river miles (6 km) downstream from Amistad Dam. The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on periodic staff gage readings and the weir discharge table. Mean daily discharge determined by prorating between readings. Records available: November 14, 1961 through February 1984 and September 1985 through 1987.

**REMARKS:** The flow of this spring is very uniform during periods of dry weather and is not modified by diversions or storage. This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir will have on the flow of this spring. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below. Prior to May 1969 the weir had an 11.1 second-foot (315 l/sec) capacity. Beginning March 1, 1984, discharge computations were temporarily discontinued due to leakage under the weir. Discharge computations were resumed on August 14, 1985.

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17.0	15.5	15.9	15.2	18.4	19.8	23.7	21.5	20.8	19.4	17.0	15.9
2	17.0	15.5	15.9	15.2	18.0	20.5	23.7	21.5	21.2	19.4	17.0	15.9
3	16.6	15.9	15.9	15.2	17.7	21.2	23.3	21.2	19.8	19.1	17.0	15.9
4	16.2	16.2	16.2	15.2	17.3	21.9	23.3	21.2	21.2	18.7	17.0	15.9
5	16.2	16.2	15.9	14.8	17.3	22.2	23.3	21.2	21.2	18.4	17.0	15.9
6	16.6	16.6	15.9	14.8	17.0	23.0	23.3	21.2	20.8	18.4	17.0	15.5
7	16.2	17.0	15.9	14.8	16.6	23.3	23.0	21.2	20.5	18.4	17.0	15.5
8	15.9	17.3	15.9	14.8	16.6	24.0	23.0	21.2	20.5	18.4	16.6	15.5
9	15.5	17.3	15.9	14.8	16.2	24.4	22.6	20.8	20.1	18.4	16.6	15.5
10	15.5	17.7	15.9	14.8	16.2	25.1	22.6	20.8	20.1	18.4	16.6	15.5
11	15.2	17.7	15.9	14.8	15.9	25.1	22.6	20.8	20.1	18.0	16.6	15.5
12	14.8	17.7	15.5	14.5	15.9	24.7	22.6	20.8	19.8	18.0	16.6	15.5
13	14.5	17.3	15.5	14.5	15.5	24.4	22.2	20.5	19.8	18.0	16.6	15.5
14	14.5	17.3	15.5	14.5	15.5	24.0	21.9	20.5	19.8	18.0	16.6	15.5
15	14.5	17.3	15.5	* 14.5	15.9	24.0	* 21.5	20.5	19.1	18.0	16.6	15.5
16	14.5	* 17.0	15.5	15.2	15.9	23.7	21.5	20.5	18.7	17.7	16.6	* 15.5
17	14.5	* 17.0	15.5	15.9	15.9	24.0	21.9	20.1	18.7	17.7	16.6	15.5
18	14.5	17.0	15.5	16.6	15.9	24.0	21.9	19.8	17.7	16.6	15.5	15.5
19	14.1	16.6	15.5	17.7	16.2	24.0	21.9	* 20.1	18.7	17.7	16.6	15.5
20	14.1	16.6	15.5	18.4	* 16.2	24.0	21.9	19.1	18.7	17.3	16.2	15.5
21	14.1	16.2	15.5	19.1	17.7	23.7	22.2	19.1	18.4	17.3	16.2	15.2
22	14.1	16.2	15.2	19.8	17.3	23.7	22.2	19.1	18.4	17.3	16.2	15.2
23	14.1	15.9	15.2	19.8	17.0	23.7	21.9	18.7	* 18.4	17.3	15.5	15.2
24	14.1	15.9	14.8	19.4	16.6	* 23.7	21.9	18.4	18.4	17.3	15.9	15.2
25	14.1	15.9	* 15.2	19.4	16.2	24.0	21.9	18.4	18.7	17.3	* 16.2	15.2
26	14.1	15.9	15.2	19.1	15.5	23.7	21.5	18.0	18.7	17.3	16.2	15.2
27	* 14.1	15.9	15.2	19.1	15.9	23.3	21.5	18.4	19.1	17.3	16.2	15.5
28	14.5	15.9	15.2	18.7	17.0	23.3	21.5	19.1	19.1	17.3	16.2	15.5
29	14.5	15.2	18.7	17.7	23.3	21.9	19.4	19.4	17.3	15.9	15.5	15.5
30	14.8	15.2	18.7	18.7	23.3	21.9	19.8	19.4	17.3	15.9	15.5	15.5
31	15.2	15.2	18.7	19.8	23.3	21.9	20.1	19.4	17.3	15.9	15.5	15.5
Sum	464.5	497.7	703.0	623.0	555.4	480.4						
	465.6	481.8	519.5	692.0	586.3	494.8						

## Current Year 1987

## Period Dec. 1961-1987

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	.75	.62	1 1	17.0	119	14.1	15.2	924	503	934
Feb.	.79	.66	110	17.7	5	15.2	16.6	921	448	411
Mar.	.72	.66	4	16.2	24	14.8	15.2	956	488	49.6
Apr.	.85	.62	12.2	19.8	14	14.1	16.6	987	500	997
May	.95	.69	21	22.2	113	15.5	16.6	1,030	563	1,317
June	1.15	.98	110	25.1	1	19.8	23.3	1,394	539	1,394
July	1.08	.98	1	23.7	115	21.5	22.2	1,373	566	1,373
Aug.	.98	.82	1 1	21.5	26	18.0	20.1	1,236	590	1,236
Sept.	.98	.82	3	21.9	121	18.4	19.4	1,163	625	1,163
Oct.	.89	.79	1 1	19.4	120	17.3	18.0	1,101	692	1,420
Nov.	.75	.75	1 1	17.0	23	15.5	16.6	981	626	1,338
Dec.	.69	.69	1 1	15.9	120	15.2	15.5	954	517	1,187
Yearly	1.15	.62		25.1		14.1	18.0	13,020	6,587	13,020
	Meters			Cubic Meters per Second				Thousands of Cubic Meters		
	0.35	0.19		0.71		0.40	0.51	16,058	8,188	16,058
0	Mean daily					Discharge measurement made on this day				
	I					And other days				

## 08-4511.30 EIGHT MILE CREEK NEAR DEL RIO, TEXAS

**DESCRIPTION:** Concrete wall with 90 V-notch weir of 6.9 second-foot (0.2 m<sup>3</sup>/sec) capacity at latitude 29°24'00", longitude 101°00'55", 0.8 creek mile (1.3 km) from the confluence with the Rio Grande, and about 8 miles (12.9 km) northwest of Del Rio, Texas. This stream enters the Rio Grande from the United States side at river mile 569.3 (916.2 km), 4.6 river miles (7.4 km) downstream from Amistad Dam, and 8.3 river miles (13.4 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage is 913.97 feet (278.58 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 12 measurements during the year. Mean daily discharges determined by prorating between measurements. Records available: March 1961 through 1987.

**REMARKS:** The source of flow of this stream is from surface runoff during rainy periods and the subsequent flow from underground seepage as result of such rains. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below. This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir may have on the flow of this stream. Bubbler gage and water-stage recorder were removed April 1, 1985.

**EXTREME FLOWS FROM RECORDS:**

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 15.9 (0.45)	July 23 & 24, 1976	Min. 0	Occasionally
Monthly:	Max. 6.3 (0.18)	July 1976	Min. 0	Occasionally
Yearly:	Max. 4.0 (0.11)	1974 & 1975	Min. 0	Several years

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.9	1.9	2.1	*	1.9	1.9	2.5	*	2.1	2.3	2.2	2.4
2	1.9	1.9	2.1	1.9	1.9	2.6	2.5	2.1	*	2.3	2.2	2.4
3	1.9	1.9	2.1	1.9	1.9	2.6	2.5	2.0	2.3	2.2	2.2	2.4
4	1.9	1.9	*	2.1	1.9	1.9	*	2.6	2.5	2.0	2.2	2.4
5	1.9	1.9	*	2.1	1.9	1.9	2.6	2.4	2.0	2.3	2.2	2.4
6	1.9	1.9	2.1	1.9	*	1.9	2.6	2.4	*	2.0	2.3	2.2
7	*	1.9	2.1	1.9	1.9	2.6	2.4	2.0	*	2.3	2.2	2.4
8	1.9	1.9	2.1	1.9	1.9	2.6	2.4	2.0	2.3	2.2	2.2	2.4
9	1.9	1.9	2.1	1.9	2.0	2.6	2.4	2.0	2.3	2.2	2.2	2.4
10	1.9	1.9	2.1	1.9	2.0	2.6	2.4	2.0	2.3	2.2	2.2	2.4
11	1.9	2.0	2.0	1.9	2.0	2.6	2.4	2.1	2.3	2.2	2.3	2.4
12	1.9	2.0	2.0	1.9	2.0	2.6	2.3	2.1	2.3	2.2	2.3	2.5
13	1.9	2.0	2.0	1.9	2.1	2.6	2.3	2.1	2.3	2.2	2.3	2.5
14	1.9	2.0	2.0	1.9	2.1	2.6	2.3	2.1	2.3	2.2	2.3	2.5
15	1.9	2.0	2.0	1.9	2.1	2.6	2.3	2.1	2.3	2.2	2.3	2.5
16	1.9	2.0	2.0	1.9	2.1	2.6	2.3	2.1	2.3	2.2	2.3	2.5
17	1.9	2.0	2.0	1.9	2.2	2.6	2.3	2.1	2.3	2.2	2.3	2.5
18	1.9	2.0	2.0	1.9	2.2	2.5	2.3	2.1	2.3	2.2	2.3	2.5
19	1.9	2.0	2.0	1.9	2.2	2.5	2.3	2.1	2.3	2.2	2.3	2.5
20	1.9	2.0	2.0	1.9	2.2	2.5	2.2	2.2	2.2	2.2	2.3	2.5
21	1.9	2.0	2.0	1.9	2.3	2.5	2.1	2.2	2.2	2.2	2.3	2.5
22	1.9	2.0	2.0	1.9	2.3	2.5	2.2	2.2	2.2	2.2	2.3	2.5
23	1.9	2.0	2.0	1.9	2.3	2.5	2.2	2.2	2.2	2.2	2.3	2.5
24	1.9	2.0	2.0	1.9	2.3	2.5	2.2	2.2	2.2	2.2	2.3	2.5
25	1.9	2.1	1.9	1.9	2.4	2.5	2.2	2.2	2.2	2.2	2.4	2.5
26	1.9	2.1	1.9	1.9	2.4	2.5	2.2	2.2	2.2	2.2	2.4	2.5
27	1.9	2.1	1.9	1.9	2.4	2.5	2.1	2.2	2.2	2.2	2.4	2.5
28	1.9	2.1	1.9	1.9	2.4	2.5	2.1	2.2	2.2	2.2	2.4	2.5
29	1.9	1.9	1.9	1.9	2.5	2.5	2.1	2.3	2.2	2.2	2.4	2.5
30	1.9	1.9	1.9	1.9	2.5	2.5	2.1	2.3	2.2	2.2	2.4	2.6
31	1.9	1.9	1.9	1.9	2.5	2.5	3.0	2.3	2.2	2.2	2.2	2.6

Sum	55.4	57.0	76.6	65.8	68.2	76.6
	58.9	62.3	66.7	71.9	67.9	68.6

## Current Year 1987

## Period #March 1961-1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Low		Average	Maximum	Minimum	
Jan.	1.1	1.9	1.1	1.9	1.1	1.9	117	114	294	0
Feb.	125	21	125	21	125	20	110	102	273	0
Mar.	1.1	21	1.1	21	1.9	20	124	107	271	0
Apr.	1.1	1.9	1.1	1.9	1.1	1.9	113	102	244	0
May	1.1	2.5	129	1.9	2.2	1.9	132	104	224	0
June	1.2	2.6	1.1	2.5	2.6	2.6	152	97.6	214	0
July	31	3.0	121	2.1	2.3	143	97.5	390	0	0
Aug.	129	2.3	13	2.0	2.1	2.1	131	99.2	299	0
Sept.	1.1	2.3	120	2.2	2.3	2.3	135	93.3	240	0
Oct.	1.1	2.2	1.1	2.2	2.2	2.2	135	111	334	0
Nov.	125	2.4	1.1	2.2	2.3	1.9	136	106	321	0
Dec.	130	2.6	1.1	2.4	2.5	2.5	152	113	283	0
				3.0	1.9	2.2	1,580	1,247	2,892	3.4
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters			
			.08	.05	.06		1,949	1,538	3,567	4.2

\* Discharge measurement made on this day

# Some months missing

! And other days

## 08-4511.40 MCKEE SPRING NEAR DEL RIO, TEXAS

**DESCRIPTION:** This spring is located on the left flood plain of the Rio Grande at latitude 29°23'35", longitude 101°01'15", about 150 feet (45.7 m) from the edge of the low-flow channel and about 8 miles (12.9 km) northwest of Del Rio, Texas. Water from this spring enters the Rio Grande at river mile 569.1 (915.9 km) 4.8 river miles (7.7 km) downstream from Amistad Dam. The zero of the gage is 894.59 feet above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 12 discharge measurements during the year. Mean daily discharges determined by prorating between measurements. Records available November 1961 through 1987.

**REMARKS:** The flow of this spring is uniform during periods of dry weather and is not modified by diversions or storage. It is estimated that backwater from the Rio Grande will reach the emergence of this spring when the river flow is approximately 14,000 second-feet (396 m<sup>3</sup>/sec). This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir may have on the flow of this spring.

**EXTREME FLOWS FROM RECORDS:**

Average Flow in Second-Feet (Cubic Meters per Second)									
Daily:	Max.	11.0 (0.31)	Feb. 16, 1983		Min. 0		Occasionally		
Monthly:	Max.	9.2 (0.26)	Feb. 1983		Min. 0		Occasionally		
Yearly:	Max.	7.8 (0.22)	1979		Min. 0		1963		

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.6	3.3	3.7	3.7	3.3	3.6	* 3.7	3.1	3.1	3.0	3.0	3.3
2	3.6	3.3	3.8	3.7	3.3	3.7	3.7	3.1	3.1	3.0	3.0	* 3.3
3	3.6	3.3	3.8	3.7	3.2	3.7	3.7	3.1	3.1	3.0	3.0	3.3
4	3.6	* 3.3	3.8	3.7	3.2	3.7	3.6	3.0	3.1	3.0	3.0	3.3
5	3.6	3.3	3.8	3.6	3.2	3.7	3.6	3.0	3.1	3.0	3.0	3.3
6	*	3.6	3.3	3.8	3.6	3.2	3.7	3.6	3.0	3.1	3.0	3.3
7	*	3.6	3.4	3.8	3.6	3.2	3.7	3.6	3.0	3.1	3.0	3.3
8	3.6	3.4	3.8	3.6	3.2	3.7	3.5	3.0	3.1	3.0	3.0	3.3
9	3.6	3.4	3.8	3.6	3.3	3.7	3.5	3.0	3.1	3.0	3.1	3.2
10	3.6	3.4	3.8	3.6	3.3	3.7	3.5	3.0	3.1	3.0	3.1	3.2
11	3.6	3.4	3.8	3.6	3.3	3.7	3.5	3.0	3.1	3.0	3.1	3.2
12	3.5	3.4	3.8	3.5	3.3	3.7	3.5	3.0	3.1	3.0	3.1	3.2
13	3.5	3.4	3.8	3.5	3.3	3.7	3.5	3.0	3.1	3.0	3.1	3.2
14	3.5	3.5	3.8	3.5	3.3	3.7	3.4	3.0	3.1	3.0	3.1	3.2
15	3.5	3.5	3.8	3.5	3.4	3.7	3.4	3.0	3.1	3.0	3.1	3.2
16	3.5	3.5	3.8	3.5	3.4	3.7	3.4	3.0	3.1	3.0	3.1	3.2
17	3.5	3.5	3.8	3.5	3.4	3.7	3.4	3.0	3.1	3.0	3.1	3.2
18	3.5	3.5	3.8	3.5	3.4	3.7	3.4	3.0	3.1	3.0	3.1	3.2
19	3.5	3.6	3.7	3.4	3.4	3.7	3.4	3.0	3.1	3.0	3.2	3.2
20	3.5	3.6	3.7	3.4	3.4	3.7	3.3	3.1	3.0	3.0	3.2	3.2
21	3.4	3.6	3.7	3.4	3.5	3.7	3.3	3.1	3.0	3.0	3.2	3.1
22	3.4	3.6	3.7	3.4	3.5	3.7	3.3	3.1	3.0	3.0	3.2	3.1
23	3.4	3.6	3.7	3.4	3.5	3.7	3.3	3.1	3.0	3.0	3.2	3.1
24	3.4	3.7	3.7	3.4	3.5	3.7	3.3	3.1	3.0	3.0	3.2	3.1
25	3.4	3.7	3.7	3.4	3.5	3.7	3.3	3.1	3.0	3.0	3.2	3.1
26	3.4	3.7	3.7	3.3	3.5	3.7	3.2	3.1	3.0	3.0	3.2	3.1
27	3.4	3.7	3.7	3.3	3.6	3.7	3.2	3.1	3.0	3.0	3.2	3.1
28	3.4	3.7	3.7	3.3	3.6	3.7	3.2	3.1	3.0	3.0	3.3	3.1
29	3.4	3.7	3.7	3.3	3.6	3.7	3.2	3.1	3.0	3.0	3.3	3.1
30	3.4	3.7	3.7	3.3	3.6	3.7	3.1	3.1	3.0	3.0	3.3	3.1
31	3.3		3.7		3.6		3.1	3.1		3.0		3.1
<b>Sum</b>		97.7		104.8		110.9		94.5		93.0		98.9
	108.4		116.4		105.0		105.6		91.9		93.7	

**Current Year 1987****Period Nov. 1961-1987**

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High		Low	High	Low			Average	Maximum	Minimum	
Jan.				! 1	3.6	31	3.3	3.5	215	290	526
Feb.				124	3.7	1!	3.3	3.5	194	270	509
Mar.				! 12	3.8	1!	3.1	3.7	231	294	527
Apr.				! 1	3.7	126	3.3	3.5	208	287	490
May				127	3.6	! 3	3.2	3.4	208	313	513
June				1 2	3.7	1	3.6	3.7	220	287	470
July				! 1	3.7	130	3.1	3.4	209	295	561
Aug.				! 1	3.1	14	3.0	3.0	187	290	504
Sep.				! 1	3.1	120	3.0	3.1	182	283	479
Oct.				! 1	3.0	! 1	3.0	3.0	184	296	519
Nov.				128	3.3	! 1	3.0	3.1	186	283	516
Dec.				! 1	3.3	121	3.1	3.2	196	287	483
					3.8		3.0	3.3	2,420	3,475	5,657
Yearly	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
				0.11		0.08	0.09	2,985	4,286	6,978	0.90

\* Discharge measurement made on this day

θ Mean daily

! And other days

## 08-4511.50 ARROYO DE LA TREINTA Y UNA NEAR CD. ACUNA, COAHUILA

**DESCRIPTION:** Cipolletti weir of 35.3 second-foot ( $1 \text{ m}^3/\text{sec}$ ) capacity, located at latitude  $29^{\circ}22'35''$ , longitude  $101^{\circ}01'15''$ , 0.6 creek mile (900 m) from the confluence with the Rio Grande, and about 6.5 miles (10.5 km) northwest of Cd. Acuna, Coahuila. This stream enters the Rio Grande from the Mexican side at river mile 567.6 (913.5 km), 6.3 river miles (10 km) downstream from Amistad Dam and 6.6 river miles (10.6 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: November 1961 through 1987.

**REMARKS:** The flow of this stream is very uniform during periods of dry weather and is not modified by diversions or storage. Prior to 1969 discharges were based on a continuous record of gage heights and the weir discharge table. Storm flow is deducted and not included in the tabulation below. This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir will have on the flow of this stream. It is estimated that backwater from the Rio Grande will affect the flow at this station only during times of extremely high releases.

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.8	2.8	2.5	2.8	2.8	3.5	3.5	3.2	2.8	2.8	2.8	2.8
2	2.8	2.8	2.5	2.8	2.8	3.5	3.5	3.2	2.8	2.8	2.8	2.8
3	2.8	2.8	2.5	2.8	2.8	3.5	3.5	3.2	2.8	2.8	2.8	2.8
4	2.8	2.8	2.5	2.8	2.8	3.5	3.5	3.2	2.8	2.8	2.8	2.8
5	2.8	2.8	2.5	2.8	2.8	3.5	3.5	3.2	2.8	2.8	2.8	2.8
6	2.8	2.8	2.5	2.8	2.8	3.5	3.5	3.2	2.8	2.8	2.8	2.8
7	2.8	2.8	2.5	2.8	2.8	3.5	3.5	3.2	2.8	2.8	2.8	2.8
8	2.8	2.8	2.5	2.8	2.8	3.5	3.5	3.2	2.8	2.8	2.8	2.8
9	2.8	2.8	2.5	2.8	2.8	3.5	3.5	3.2	2.8	2.8	2.8	2.8
10	2.8	2.8	2.5	2.8	2.8	3.5	3.5	3.2	2.8	2.8	2.8	2.8
11	2.8	2.8	2.5	2.8	2.8	3.5	3.5	3.2	2.8	2.8	2.8	2.8
12	2.8	2.8	2.5	2.8	2.8	3.5	3.5	3.2	2.8	2.8	2.8	2.8
13	2.8	2.8	2.5	2.8	2.8	3.5	3.5	3.2	2.8	2.8	2.8	2.8
14	2.8	2.8	2.5	2.8	2.8	3.5	3.5	3.2	2.8	2.8	2.8	2.8
15	2.8	2.8	2.5	2.8	2.8	3.5	3.5	3.2	2.8	2.8	2.8	2.8
16	2.8	2.8	2.5	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
17	2.8	2.8	2.5	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
18	2.8	2.5	2.5	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
19	2.8	2.5	2.5	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
20	2.8	2.5	2.5	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
21	2.8	2.5	2.8	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
22	2.8	2.5	2.8	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
23	2.8	2.5	2.8	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
24	2.8	2.5	2.8	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
25	2.8	2.5	2.8	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
26	2.8	2.5	2.8	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
27	2.8	2.5	2.8	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
28	2.8	2.5	2.8	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
29	2.8	2.5	2.8	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
30	2.8	2.5	2.8	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
31	2.8	2.5	2.8	2.8	3.2	3.5	3.5	3.2	2.8	2.8	2.8	2.8
<b>Sum</b>		75.1	84.0	105.0	94.4	86.8	86.8	86.8	84.0	84.0	84.0	86.8
86.8		81.4	95.2	104.6	84.0	84.0	84.0	84.0	84.0	84.0	84.0	86.8

Current Year 1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Period 1961-1987			
	High	Low	Day	High			Average	Maximum	Minimum	
	High	Low	Day	High	Day	Day	Average	Maximum	Minimum	
Jan.	0.43	0.43	! 1	2.8	! 1	2.8	2.8	169	282	15.2
Feb.	.43	.36	! 1	2.8	! 18	2.5	2.8	149	152	13.9
Mar.	.43	.36	! 19	2.8	! 1	2.5	2.6	161	166	327
Apr.	.43	.43	! 1	2.8	! 1	2.8	2.8	174	302	10.5
May	.49	.43	! 28	3.5	! 1	2.8	3.2	189	170	262
June	.49	.49	! 1	3.5	! 1	3.5	3.5	210	155	254
July	.49	.43	! 1	3.5	! 19	3.2	3.5	208	157	253
Aug.	.43	.43	! 1	3.2	! 20	2.8	3.2	187	162	323
Sept.	.43	.43	! 1	2.8	! 1	2.8	2.8	168	172	273
Oct.	.39	.39	! 1	2.8	! 1	2.8	2.8	173	183	282
Nov.	.39	.39	! 1	2.8	! 1	2.8	2.8	168	173	310
Dec.	.39	.39	! 1	2.8	! 1	2.8	2.8	173	173	310
0.49		0.36	3.5	2.5	2.8	2,127	2,006	3,264	250	
Yearly		Meters		Cubic Meters per Second			Thousands of Cubic Meters			
		0.15	0.11	0.10	0.07	0.08	2,626	2,474	4,025	309

Mean daily

And other days

## 08-4513.00 CANTU SPRING NEAR DEL RIO, TEXAS

**DESCRIPTION:** Concrete enclosure located at the spring source in the channel of a small tributary to Cienegas Creek at latitude 29° 23' 15", longitude 100° 56' 00", about 2.5 miles (4.0 km) northwest of Del Rio, Texas and 3.5 creek miles (5.6 km) from the confluence with the Rio Grande. Cienegas Creek enters the Rio Grande at river mile 562.9 (905.8 km) 1.8 river miles (3.0 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on 12 discharge measurements during the year. Mean daily discharges determined by prorating between measurements. Records available: March 1961 through 1987.

**REMARKS:** The flow of this spring is very uniform and is not modified by diversions or storage. A weir was installed on May 24, 1961 and removed November 21, 1962. This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir may have on the flow of this spring.

**EXTREME FLOWS FROM RECORDS:**

Average Flow in Second-Feet (Cubic Meters per Second)											
Daily:	Max.	10.1 (0.29)		October 20, 1982				Min. 0		Occasionally	
Monthly:	Max.	9.3 (0.26)		March 1982				Min. 0		Occasionally	
Yearly:	Max.	8.3 (0.24)		1982				Min. 0		1963	

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.7	5.9	5.8	7.2	7.2	9.1	9.1	7.9	8.8	9.0	6.8	7.2
2	6.7	5.9	5.8	7.2	7.2	9.2	9.1	7.9	8.8	9.0	6.7	7.2
3	6.8	5.8	5.8	7.2	7.2	9.2	9.0	7.8	8.8	9.0	6.6	7.3
4	6.8	5.8	5.8	7.2	7.2	9.3	9.0	7.8	8.8	9.0	6.5	7.3
5	6.8	5.8	5.8	7.2	7.2	9.3	8.9	7.7	8.8	9.0	6.5	7.4
6	6.9	5.8	5.9	7.2	7.2	9.3	8.9	7.7	8.8	9.0	6.6	7.5
7	*	6.9	5.8	5.9	7.2	9.3	8.9	7.7	8.8	9.0	6.6	7.6
8	6.9	5.8	6.0	7.2	7.3	9.3	8.8	7.8	8.8	8.9	6.6	7.6
9	6.8	5.8	6.0	7.2	7.4	9.3	8.8	7.8	8.8	8.8	6.6	7.7
10	6.8	5.8	6.1	7.2	7.5	9.3	8.8	7.9	8.8	8.7	6.7	7.8
11	6.7	5.8	6.1	7.2	7.6	9.2	8.7	7.9	8.9	8.6	6.7	7.8
12	6.7	5.8	6.2	7.2	7.6	9.2	8.7	7.9	8.9	8.5	6.7	7.9
13	6.7	5.8	6.2	7.2	7.7	9.2	8.6	8.0	8.9	8.5	6.7	8.0
14	6.6	5.8	6.3	7.2	7.8	9.2	8.6	8.0	8.9	8.4	6.8	8.0
15	6.6	5.8	6.3	7.2	7.9	9.2	8.6	8.1	8.9	8.3	6.8	8.1
16	6.5	5.8	6.4	7.2	7.9	9.2	8.5	8.1	8.9	8.2	6.8	8.2
17	6.5	5.8	6.4	7.2	8.0	9.2	8.5	8.1	8.9	8.1	6.8	8.3
18	6.5	5.8	6.5	7.2	8.1	9.2	8.5	8.2	8.9	8.0	6.9	8.3
19	6.4	5.8	6.5	7.2	8.1	9.2	8.4	8.2	8.9	7.9	6.9	8.4
20	6.4	5.8	6.6	7.2	8.2	9.2	8.4	8.3	8.9	7.8	6.9	8.5
21	6.4	5.8	6.6	7.2	8.3	9.2	8.4	8.3	8.9	7.8	6.9	8.5
22	6.3	5.8	6.7	7.2	8.4	9.2	8.3	8.4	8.9	7.7	7.0	8.6
23	6.3	5.8	6.7	7.2	8.4	9.2	8.3	8.4	8.9	7.6	7.0	8.7
24	6.2	5.8	6.8	7.2	8.5	9.2	8.2	8.2	8.9	7.5	7.0	8.7
25	6.2	5.8	6.8	7.2	8.6	9.1	8.2	8.5	8.9	7.4	7.0	8.8
26	6.2	5.8	6.9	7.2	8.6	9.1	8.2	8.5	8.9	7.3	7.1	8.9
27	6.1	5.8	6.9	7.2	8.7	9.1	8.1	8.6	8.9	7.2	7.1	9.0
28	6.1	5.8	7.0	7.2	8.8	9.1	8.1	8.6	8.9	7.1	7.1	9.0
29	6.0		7.0	7.2	8.9	9.1	8.1	8.6	9.0	7.0	7.1	9.1
30	6.0		7.1	7.2	8.9	9.1	8.0	8.7	9.0	6.9	7.2	9.2
31	6.0		7.1		9.0		7.9	8.7		6.9		9.2

<b>Sum</b>	162.6	216.0	276.0	252.5	252.2	253.8
	201.5	198.0	246.7	264.6	266.2	204.7

**Current Year 1987****Period March 1961-1987**

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	! 6	6.9	129	6.0	6.5	400	319	565	0	
Feb.	! 1	5.9	13	5.8	5.8	323	280	478	0	
Mar.	130	7.1	11	5.8	6.4	393	302	569	0	
Apr.	! 1	7.2	11	7.2	7.2	428	286	486	0	
May	31	9.0	11	7.2	8.0	489	291	508	0	
June	1 4	9.3	1 1	9.1	9.2	547	279	547	0	
July	! 1	9.1	31	7.9	8.5	525	284	525	0	
Aug.	130	8.7	15	7.7	8.1	501	284	526	0	
Sept.	129	9.0	1 1	8.8	8.9	528	292	528	0	
Oct.	! 1	9.0	130	6.9	8.1	500	323	567	0	
Nov.	30	7.2	4	6.5	6.8	406	306	521	0	
Dec.	130	9.2	1	7.2	8.2	503	323	544	0	
			9.3	5.8	7.7	5,543	3,569	6,019	0	
<b>Yearly</b>	<b>Meters</b>			<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>			
				0.26	0.16	0.22	6,837	4,402	7,424	0

\* Discharge measurement made on this day

! And other days

## 08-4515.00 CIENEGAS CREEK NEAR DEL RIO, TEXAS

**DESCRIPTION:** Measurement sections located, one each, on the right bank of the Cienegas Creek at latitude 29° 21' 10", longitude 100° 56' 35", 0.5 creek mile (0.8 km) from the confluence with the Rio Grande; and for the Briggs Farm ditch, on the right bank at latitude 29° 21' 40", longitude 100° 56' 30", 2,900 feet (884 m) from the ditch intake which branches off the right bank of Cienegas Creek immediately upstream from a small diversion dam across the creek, and about 2.5 miles (4.0 km) west of Del Rio, Texas. The point of diversion is 1.8 creek miles (2.9 km) from the confluence with the Rio Grande. Cienegas Creek enters the Rio Grande at river mile 562.9 (905.8 km) 1.8 river miles (3.0 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila.

**RECORDS:** Based on 12 and 12 discharge measurements at Cienegas Creek and Briggs Farm ditch, respectively, during the year. Mean daily discharge computations determined by combining the two records for the total yield of the springs. Records available: March 1965 through 1987. Discharge measurement data available since November 1962. Records are also available from September 1931 through June 1935 for a station 0.3 creek mile (0.5 km) downstream. The station was moved 0.2 creek mile (0.3 km) upstream in June 1983.

**REMARKS:** Low flow of this stream is from springs, one of which is Cantu Spring, whose discharge is shown on page 39. The flow of this stream is modified by irrigation diversions through the Briggs Farm ditch. All storm flow passing this station is deducted and is not included in the tabulation. These stations were established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir may have on the flow of these springs.

**EXTREME FLOWS FROM RECORDS:**

				Average Flow in Second-Feet (Cubic Meters per Second)											
Daily:	Max. 42.7 (1.21)	August 12, 1972	Min. 0.5 (0.01)									April 21, 1966			
Monthly:	Max. 24.8 (0.70)	July 1976	Min. 0.8 (0.02)									August 1967			
Yearly:	Max. 17.9 (0.51)	1977	Min. 2.2 (0.06)									1968			

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11.9	13.5	15.1	14.2	13.2	19.1	15.8	12.9	14.6	13.6	15.7	17.4
2	12.0	13.5	15.2	14.2	13.1	19.4	15.7	12.8	14.7	13.5	15.7	17.5
3	12.0	13.5	15.2	14.2	13.1	19.6	15.6	12.8	14.6	13.6	15.8	17.4
4	12.1	13.6	15.3	14.2	13.1	19.8	15.6	12.7	14.7	13.5	15.9	17.3
5	12.1	13.7	15.3	14.2	13.0	19.7	15.5	12.6	14.6	13.4	16.0	17.3
6	12.2	13.7	15.2	14.1	13.0	19.5	15.4	12.5	14.5	13.5	16.0	17.2
7	12.2	13.8	15.2	14.1	13.2	19.4	15.3	12.3	14.6	13.4	16.1	17.2
8	12.3	13.8	15.1	14.1	13.5	19.2	15.1	12.4	14.5	13.5	16.2	17.1
9	12.4	13.9	15.1	14.0	13.7	19.1	15.0	12.5	14.4	13.6	16.2	17.1
10	12.3	14.0	15.1	13.9	13.9	18.9	15.0	12.6	14.5	13.6	16.3	17.0
11	12.4	14.0	15.0	14.0	14.2	18.8	14.9	12.6	14.4	13.7	16.3	16.9
12	12.5	14.1	15.0	13.9	14.4	18.6	14.8	12.7	14.3	13.8	16.3	16.8
13	12.5	14.1	15.0	13.8	14.6	18.5	14.7	12.8	14.2	13.9	16.4	16.8
14	12.6	14.2	14.9	13.9	14.9	18.4	14.6	12.9	14.3	14.0	16.5	16.7
15	12.7	14.3	14.9	13.8	15.1	18.2	14.5	13.0	14.2	14.2	16.5	16.6
16	12.6	14.3	14.8	13.7	15.3	18.1	14.5	13.1	14.1	14.2	16.6	16.5
17	12.7	14.4	14.8	13.8	15.6	17.9	14.4	13.2	14.2	14.3	16.7	16.6
18	12.8	14.5	14.8	13.7	15.8	17.7	14.3	13.3	14.1	14.4	16.7	16.5
19	12.8	14.5	14.7	13.6	16.0	17.5	14.2	13.4	14.0	14.5	16.7	16.4
20	12.9	14.6	14.7	13.6	16.3	17.4	14.0	13.5	14.1	14.6	16.8	16.4
21	13.0	14.6	14.7	13.6	16.5	17.2	13.9	13.6	14.0	14.7	16.9	16.3
22	12.9	14.7	14.6	13.5	16.8	17.1	13.9	13.7	13.9	14.7	16.9	16.2
23	13.0	14.8	14.6	13.5	17.0	17.0	13.8	13.8	14.0	14.8	17.0	16.1
24	13.1	14.8	14.5	13.5	17.2	16.8	13.7	13.9	14.9	17.1	16.0	16.0
25	13.1	14.9	14.5	13.4	17.5	16.7	13.6	14.0	13.8	15.0	17.1	16.0
26	13.2	14.9	14.5	13.4	17.7	16.5	13.5	14.1	13.9	15.1	17.2	16.0
27	13.2	15.0	14.4	13.4	17.9	16.4	13.4	14.2	13.8	15.1	17.3	15.9
28	13.2	15.1	14.4	13.3	18.2	16.2	13.4	14.3	13.7	15.2	17.2	15.8
29	13.3	14.4	14.4	13.3	18.4	16.1	13.3	14.3	13.6	15.3	17.3	15.8
30	13.4	14.3	14.3	13.2	18.6	15.9	13.2	14.4	13.7	15.5	17.4	15.7
31	13.4	14.3	14.3	13.2	18.9	15.1	13.1	14.5	14.5	15.6	17.5	15.6

Sum	398.8	413.1	540.7	411.4	442.7	514.1
	392.8	459.6	479.7	447.7	425.9	496.8

**Current Year 1987**      **Period March 1965-1987**

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	Day			Average	Maximum	Minimum
Jan.	130	13.4	1	11.9	12.7	779	799	1,242	134
Feb.	28	15.1	1	13.5	14.2	791	739	1,157	98.0
Mar.	14	15.3	130	14.3	14.8	912	769	1,185	102
Apr.	11	14.2	30	13.2	13.8	819	708	1,125	100
May	31	18.9	1	13.0	15.5	951	698	1,159	109
June	4	19.8	30	15.9	18.0	1,072	649	1,072	86.3
July	1	15.8	31	13.1	14.4	888	643	1,527	85.5
Aug.	31	14.5	7	12.3	13.3	816	648	1,241	48.4
Sept.	12	14.7	29	13.6	14.2	845	638	1,043	84.1
Oct.	31	15.6	1	13.4	14.3	878	759	1,135	150
Nov.	30	17.4	1	15.7	16.6	985	757	1,117	152
Dec.	2	17.5	31	15.6	16.6	1,020	795	1,168	133
			19.8	11.9	14.9	10,756	8,602	12,955	1,531
Yearly	Meters		Cubic Meters per Second		Thousands of Cubic Meters				
			0.56	0.34	0.42	13,267	10,610	15,992	1,688

## 08-4518.00 RIO GRANDE AT DEL RIO, TEXAS

AND CD. ACUNA, COAHUILA

**DESCRIPTION:** Cableway, gravity well, concrete control weir, water-stage recorders (graphic and digital) and data collection platform located on the right bank at latitude 29° 19' 40", longitude 100° 55' 50", and river mile 561.2 (903.2 km), 1,200 feet (366 m) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila and 12.7 river miles (20.4 km) downstream from Amistad Dam. The zero of the gage is 869.20 feet (264.93 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 28 discharge measurements during the year, 11 by the United States Section and 17 by the Mexican Section of the Commission, and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: December 1923 through July 2, 1941 and January 1958 through 1987. Records are available from May 1900 through April 1915 for a station 12.2 miles (19.6 km) upstream; for December 1919 through March 1920 for a station 8.7 miles (14.0 km) upstream near McKee's Switch; from July 2, 1941 through 1954 and October 1960 through 1967 for a station 1,200 feet (366 m) downstream at the international highway bridge; and from September 1954 through 1987 for a station, Rio Grande below Amistad Dam, 10.6 miles (17.0 km) upstream.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. Except for tributary inflows and small intervening diversions below Amistad Dam, flow at this station after May 31, 1968 is controlled largely by releases from Amistad Reservoir. The data collection platform, operated in cooperation with the National Weather Service, relays gage height data upon interrogation by telephone via commercial circuits.

**EXTREME FLOWS FROM RECORDS:** The greatest recorded flow of 1,140,000 second-feet (32,300 m<sup>3</sup>/sec) occurred on June 28, 1954, with a gage height of 38.25 feet (11.66 m) at a station 1,200 feet (366 m) downstream. The lowest recorded flow was 124 second-feet (3.51 m<sup>3</sup>/sec) which occurred March 5 and 6, 1969, with a gage height of 1.24 feet (0.38 m).

Average Flow in Second-Feet (Cubic Meters per Second) \*\*

Daily:	Max. 63,800 (1,810)	Sept. 22, 1974	Min. 164 (4.64)	Aug. 13, 1971
Monthly:	Max. 22,300 (632)	Sept. 1974	Min. 188 (5.32)	October 1971
Yearly:	Max. 5,170 (146)	1974	Min. 701 (19.9)	1972

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,100	3,640	3,370	2,770	1,470	1,460	4,520	4,420	4,480	2,630	1,970	466
2	2,020	3,310	2,340	1,520	1,480	4,620 *	4,420	4,450	2,610	1,970	466	466
3	2,020	3,310 *	3,360	2,350	1,410	1,500	4,640	4,410	4,650 *	2,630	1,970	505
4	2,060	3,300	3,350	2,340	1,770	1,480	4,640	4,430	4,610	2,000	1,970	446
5	2,060 *	3,420	3,350	2,370	1,630	1,710	4,590	4,470	4,600	2,000	1,970 *	392
6	2,060	3,330	3,360	2,360	1,810	1,630	4,600	4,460 *	4,440	2,900	2,070	385
7	2,050	3,330	3,380	1,610	1,780 *	1,520	2,810	4,460	4,590	2,940	2,090	388
8	2,060	3,340	3,380	1,500	1,460	1,490	2,400	4,470	4,610	2,930	2,080	388
9	2,060	3,330	3,390	1,570	1,380	2,000	2,450	4,450	4,440	2,940	2,070	406
10	2,060	3,360	3,400	2,250	1,380	2,970	2,390	4,490	4,480	2,940	2,060	466
11	2,070	3,250	3,410	2,270	1,390	3,210	2,370	4,500	4,430	2,920	2,060	469 *
12	2,070	3,450	3,090	2,290	1,370	3,240	2,370	4,480	4,040	2,960	2,100	474
13	2,070	3,340	3,590	2,240	1,410	3,250	2,400	4,420	3,940	3,250	2,080	479
14	2,080	3,330	3,370	2,280	1,390	3,250	2,370	4,420	4,000	2,940	2,030	494
15	2,070	3,330	3,400	1,570	1,400	3,280	2,250	4,420	2,610	2,950 *	2,010	956
16	4,090	3,350	3,420	1,500	1,380	4,390	2,370	4,410	2,250	2,050	2,020	709
17	4,540	3,320	3,340	1,510	1,390	4,430	2,300	4,190	2,080	2,010	2,030	883
18	4,520	3,350	3,180	1,010	1,120	4,470 *	3,660	3,960	2,100 *	1,330	1,330	872
19	4,520	3,350	3,480	1,240	1,480	4,450	3,930	3,970	2,140	1,580	557	883
20	4,550	3,360 *	3,360	1,520	1,470	4,490	4,100	3,940 *	2,070	1,580	513	876
21	4,560	3,350	3,370	1,530	1,540	4,540	4,380	3,910	2,030	1,580	505	869
22	4,560	3,350	3,350	1,470	1,440	4,410	4,320	3,900	2,030	1,620	503	836
23	4,550	3,360	3,360	1,470	1,440	4,100	4,360	3,900	2,100	1,600	498	835
24	4,540	3,440	3,350	1,490	1,430	4,320	4,370	2,580	2,070	1,600	473	832
25	4,540	3,420	3,360	1,500	1,950	4,460	4,450	2,260	2,330	1,590	447	827
26	4,550	3,360	3,400	1,470	1,530	4,430	4,480	2,310	2,090	1,550	469	817
27	4,480	3,400	1,440	1,410	4,500	4,500	2,330	2,020	1,510	462	825	
28	4,480	3,330	3,380	1,450	1,440	4,550	4,470	2,430	2,030	1,520	466	829
29	4,520 *	3,370	1,450	1,470	4,590	4,340	3,940	2,080	1,540	469	831	
30	4,510	3,370	1,440	1,430	4,540	4,440	4,500	2,030	1,530	466	828	
31	4,510	3,110	1,480	1,480	4,410	4,500				1,960		832
<b>Sum</b>	94,070	53,600	100,180	123,750	67,760					20,564		
	102,920	104,250	46,270	114,300	95,820					41,708		

## Current Year 1987

## Period #1968-1987

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	3.01	2.31	120	4,590	1 2	2,000	3,320	204,139	97,506	221,105
Feb.	3.04	2.40	124	4,730	4	2,260	3,360	186,585	125,717	148,205
Mar.	3.04	1.67	16	4,730	31	609	3,360	206,777	151,762	182,036
Apr.	3.02	1.55	1	4,640	129	440	1,790	106,314	130,732	380,707
May	2.86	1.50	25	3,940	18	376	1,490	91,775	211,403	542,598
June	3.37	1.56	23	6,340	1 1	453	3,340	198,704	159,606	338,718
July	3.05	1.60	2	4,770	114	508	3,690	226,711	141,283	367,024
Aug.	3.04	2.39	10	4,730	25	2,230	3,990	245,454	164,858	260,572
Sept.	3.36	2.30	1 3	6,290	27	1,970	3,190	190,056	205,913	1,327,497
Oct.	3.29	1.54	13	5,930	127	427	2,190	134,400	158,226	815,207
Nov.	2.40	1.55	13	2,260	25	440	1,390	82,727	103,571	927,524
Dec.	2.59	1.47	15	2,900	17	339	663	40,788	84,495	228,774
	3.37	1.47		6,340		339	2,640	1,914,430	1,735,072	3,743,795
	Meters			Cubic Meters per Second			Thousands of Cubic Meters			
	1.03	0.45		180		9.60	74.8	2,361,411	2,140,177	4,617,896
										627,327

\*\* Period 1968-1987

\* Discharge measurement made on this day

! And other days

# Values for January 1968 are Rio Grande near Del Rio less Arroyo Las Vaecas flow

## 08-4520.00 ARROYO DE LAS VACAS AT CD. ACUNA, COAHUILA

**DESCRIPTION:** Cableway with sit-down cable car, concrete wall with a V-shape concrete control weir of 353 second-foot ( $10 \text{ m}^3/\text{sec}$ ) capacity, gravity well, and water-stage recorder located on the left bank at Cd. Acuna, Coahuila, latitude  $29^{\circ} 19' 45''$ , longitude  $100^{\circ} 57' 20''$  and 1.8 creek miles (3 km) from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 561.0 (902.9 km) on the upstream side of the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila and 12.9 river miles (20.7 km) downstream from Amistad Dam. The zero of the gage is 885.82 feet (270 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 14 discharge measurements during the year, a stable rating curve up to 353 second-feet ( $10 \text{ m}^3/\text{sec}$ ), which is the capacity of the weir, and a continuous record of gage heights. Computations by shifting control methods for flows exceeding the capacity of the weir. During 1987, the capacity of the weir was exceeded on June 5, and 6. Records available: Occasional estimates from June 1935 to March 19, 1938 and a continuous record from March 20, 1938 through 1987.

**REMARKS:** Low flow of this stream is from springs and is modified by irrigation diversions upstream. On June 17, 1961, a flood destroyed the station, leaving the control wall under several feet of silt. The station was reconstructed in September and a V-shape concrete control weir with a capacity of 353 second-feet ( $10 \text{ m}^3/\text{sec}$ ), constructed at this station, started operating December 14, 1961. On June 28, 1954, backwater from the Rio Grande reached an elevation of 902.49 feet (275.08 m) at this station. Records prior to 1965 were published under the title "Arroyo Las Vacas near Cd. Acuna, Coahuila."

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 63,570 second-feet ( $1,800 \text{ m}^3/\text{sec}$ ) with a gage height of 25.26 feet (7.70 m) on June 17, 1961. Min. no flow on several occasions.

Average Flow in Second-Feet (Cubic Meters per Second)\*#

Daily: Max.	23,940	(678)	June 17, 1961	Min. 0
Monthly: Max.	1,050	(29.8)	June 1961	Min. 0.4 (0.01)
Yearly: Max.	96.7	(2.74)	1961	Min. 2.8 (0.08)

December 23, 1956
October 1952
1952

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.0	10.2	7.4	7.8	13.8	180	15.5	6.7	12.7	8.1	5.7	8.5
2	12.0	9.9	8.5	8.1	14.1	129	13.1	6.4	8.8	7.1	5.7	7.8
3	11.7	9.2	8.8	6.4	11.7	134 *	12.7	6.4	7.8	7.1	5.7	8.8
4	12.0	8.8	6.7	7.1	9.9	53.7	12.0	6.4	7.4	7.1	5.3	7.4
5	12.0	33.5	10.2	8.1	9.2	1,600 *	10.6	9.2	7.8	9.2	5.7	7.1
6	12.7	16.6	8.5	9.5	9.9	477	11.3	8.8	8.5	10.6	5.7	9.2
7	13.1	13.8	6.4	13.1	11.3	241	13.4	7.1	8.8	10.6	6.0	9.9
8	12.0	15.5	6.4	10.6	11.7	150	12.4	8.5	9.2	10.2	7.4	9.2
9	10.9	16.2	8.8	8.8	10.6	127	11.3	6.7	10.9	10.2	8.1	9.5
10	11.3	15.5	9.2	8.5	11.3	101	11.3	8.1	10.9	7.1	6.4	8.5
11	12.0	13.8	12.4	8.1	11.3	95.7	10.6	6.0	11.7	5.3	6.0	8.5
12	12.0	11.3	10.6	8.8	9.2	75.2	10.6	5.3	11.7	4.9	6.4	8.5
13	12.4	11.3	8.8	8.5	8.1	74.2	10.2	4.9	10.6	6.4	6.7	9.9
14	12.0	10.6	8.1	7.1	7.8	66.4	10.6	5.7	10.2	4.2	6.7	10.9
15	11.3	7.4	10.2	6.7	*	11.3	51.9	8.5	10.6	4.6	6.7	10.2
16	11.7	8.1	10.2	7.1	12.0	44.8 *	11.7	5.7	8.5 *	4.9	7.8	8.5
17	12.7	7.1	8.8	7.1	9.9	35.3	10.9	4.9	7.8	8.1	9.9	9.9
18	11.7	7.1	6.7	7.1	76.6	29.3	10.6	4.9	7.8	4.9	7.8	10.9
19	10.6	7.8	7.8	7.8	43.1	25.8	10.6	4.9	7.1	4.9	7.4	12.4
20	11.3	8.5	9.2	62.9	11.3	22.6	9.9	5.7	7.4	6.0	7.1	10.6
21	11.3	8.5	11.3	125	11.3	20.5	9.5	5.3	7.4	6.4	7.1	10.2
22	11.3	8.5	13.1	38.1	12.0	19.4	8.5	4.9	7.8	5.7	7.1	9.9
23	* 10.2	9.9	9.9	21.9	10.9	18.4	7.1	4.6	9.2	6.0	8.5	10.6
24	11.3	16.2	9.2	26.1	10.6	17.7	6.4	4.2	9.2	6.0	8.5	10.2
25	11.7	10.9	9.2	24.0	9.9	16.6	6.4	4.6	6.7	7.1	9.5	11.3
26	10.2	* 10.2	8.8	20.8	9.2	15.9	12.7	4.6	6.0	6.4	9.9	12.0
27	9.5	10.6	6.4	18.4	8.5	15.5	15.9	4.9	6.0	5.7	10.2	12.7
28	10.9	8.1	6.4	15.9	71.3	14.8	12.7	*	18.7	6.7	5.3	13.8
29	10.2	6.0	*	14.5	132	14.8	11.3	12.7	7.8	5.7	10.2	12.4
30	10.2	6.4	13.1	31.4	25.8	9.5	14.8	8.5	5.7	8.5	11.3	12.0
31	9.9		7.8	137		7.8	15.5		5.7			
<b>Sum</b>		325.1		537.0		3,893.3		222.0		204.0		312.6
	354.1		268.2		758.2		335.6		261.5		222.1	

## Current Year 1987

## Period 1938-1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	Day			Average	Maximum	Minimum
Jan.	.62	.52	17	14.8	126	8.5	11.3	70.0	386
Feb.	1.54	.46	5	177	18	6.7	11.7	645	478
Mar.	.62	.43	110	13.8	14	5.7	8.5	532	518
Apr.	2.30	.33	20	523	1	2.5	18.0	1,064	1,365
May	2.62	.46	118	745	18	6.7	24.4	1,505	1,284
June	5.54	.59	5	4,130	29	12.7	130	7,728	2,478
July	1.12	.43	26	72.4	23	5.7	10.9	666	1,371
Aug.	.89	.33	28	39.6	18	2.8	7.1	440	1,316
Sept.	.62	.46	1	14.8	125	6.0	8.8	518	2,393
Oct.	.56	.33	16	10.9	19	2.8	6.7	405	1,684
Nov.	.56	.43	25	10.9	4	4.9	7.4	440	427
Dec.	.62	.49	119	13.8	14	7.1	10.2	620	363
	5.54	.33		4,130		2.5	21.2	15,266	14,063
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters		
	1.69	0.10	117		0.07	0.60	18,832	17,351	86,384
									2,555

\*\* Period 1938-1987

\* Discharge measurement made on this day

! And other days

## 08-4528.00 SAN FELIPE SPRINGS AT DEL RIO, TEXAS

**DESCRIPTION:** Two large and at least two smaller springs rise near the northeast city limits of Del Rio, Texas in or near the channel of San Felipe Creek at latitude 29° 22' 20" and longitude 100° 53' 00". The total yield of these springs consists of waters measured in the Val Verde Canal at Del Rio, Texas and in San Felipe Creek at Moore Park, Del Rio, Texas and diversions by the city of Del Rio. Diversions by the San Felipe Irrigation Company through the Val Verde Canal are measured at a gaging station consisting of a paved measuring section and gravity well and water-stage recorder located on the left side of the canal under the U. S. Highway 277 Bridge across San Felipe Creek at latitude 29° 21' 55" and longitude 100° 53' 10". The bridge is located about 0.6 creek mile (1.0 km) downstream from the source of the springs and 3.9 creek miles (6.3 km) from the confluence of the creek with the Rio Grande. The gaging station on San Felipe Creek at Moore Park consists of gravity well and water-stage recorder located on the left bank about 300 feet (91 m) downstream from the U. S. Highway 277 Bridge at latitude 29° 21' 50" and longitude 100° 53' 10". This stream enters the Rio Grande at river mile 902.1 km), 0.5 river mile (0.8 km) downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zeros of the gages for the two stations are, respectively, 942.58 feet (287.30 m) and 930.77 feet (283.70 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Records for the Val Verde Canal and San Felipe Creek at Moore Park are based on 40 and 38 discharge measurements, respectively, by wading during the year, and continuous records of gage heights. Computations by shifting control methods. Records for the Del Rio Pumping Plant are furnished by the city of Del Rio Water Department. Records available: Total yield of the springs, February 1961 through 1987.

**REMARKS:** The flows tabulated below represent only the total yield of the springs. All storm runoff has been eliminated from the tabulations.

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 171 (4.84)	July 23, 1976	Min. 29.2 (0.83)	July 29, 1964
Monthly:	Max. 153 (4.33)	December 1976	Min. 34.4 (0.97)	August 1964
Yearly:	Max. 149 (4.22)	1977	Min. 50.5 (1.43)	1963

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	120	123	124	132	121	133	155	140	152	147	142	139
2	120	124	125	131	120	139	147	143	149	145	137	140
3	120	127	127	129	121	136	138	141	149	146	138	139
4	120	126	128	128	121	130	137	153	148	148	138	140
5	120	125	132	126	122	160	136	152	148	150	144	142
6	121	124	127	128	122	169	134	161	150	149	144	143
7	122	125	129	126	129	160	133	159	150	147	144	143
8	122	125	125	128	131	157	137	156	149	145	142	138
9	122	125	123	127	129	150	141	166	150	148	141	143
10	124	125	123	129	130	146	139	168	149	151	145	142
11	124	127	123	132	129	145	141	165	150	146	139	137
12	121	126	126	130	124	142	143	162	153	155	140	136
13	120	127	125	131	144	143	145	162	148	155	133	137
14	120	123	124	123	145	146	146	162	149	154	139	136
15	120	124	123	122	139	147	146	161	148	149	138	138
16	120	126	122	134	135	147	150	163	149	146	139	137
17	121	124	134	132	147	153	158	145	146	146	136	141
18	120	121	126	137	133	146	151	153	151	147	136	138
19	120	124	125	139	133	143	154	154	150	149	138	146
20	120	122	125	139	133	138	150	153	149	146	137	141
21	120	121	124	135	130	143	152	150	155	151	136	137
22	120	123	125	122	127	135	151	150	154	153	138	137
23	119	122	124	122	131	141	151	151	154	156	133	139
24	119	121	127	125	137	140	143	152	152	157	134	139
25	118	122	125	121	139	142	145	153	154	157	134	138
26	119	124	127	122	149	140	140	154	157	162	134	142
27	122	123	129	126	146	142	142	151	156	157	137	138
28	122	127	130	122	145	144	139	146	146	159	136	139
29	121		129	122	141	141	141	156	151	148	138	136
30	121		133	128	135	153	143	155	147	144	141	140
31	121		135	140				143	153	142		139

<b>Sum</b>	3,476	3,850	4,345	4,803	4,655	4,320
	3,739	3,914	4,123	4,466	4,512	4,151

## Current Year 1987

## Period Feb. 1961-1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	Day			Average	Maximum	Minimum
Jan.	110	124	25	118	121	7,416	6,819	9,370	2,274
Feb.	111	127	118	121	124	6,895	6,075	8,212	2,119
Mar.	31	135	116	122	126	7,763	6,618	9,029	2,365
Apr.	119	139	25	121	128	7,636	6,376	8,602	2,291
May	26	149	2	120	133	8,178	6,666	9,300	2,812
June	6	169	4	130	145	8,618	6,493	9,049	2,481
July	1	155	7	133	144	8,858	6,723	9,342	2,214
Aug.	10	168	1	140	155	9,527	6,702	9,527	2,114
Sept.	26	157	17	145	150	8,949	6,531	8,949	2,555
Oct.	26	162	31	142	150	9,233	6,888	9,249	2,508
Nov.	10	145	23	133	138	8,233	6,662	8,965	2,384
Dec.	19	146	112	136	139	8,569	6,945	9,431	2,390
			169		118	138	99,875	79,498	107,892
<b>Yearly</b>	<b>Meters</b>		<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>			
			4.79	3.34	3.91	123,194	98,059	133,083	45,121

0 Mean daily

! And other days

## 08-4530.00 SAN FELIPE CREEK NEAR DEL RIO, TEXAS

**DESCRIPTION:** Cableway, bubbler gage, and water-stage recorders (graphic and digital) located on the right bank at latitude 29°19'50", longitude 100°53'20", immediately upstream from the Silos Farm road bridge, 1.1 creek miles (1.8 km) from the confluence with the Rio Grande, and about 2 miles (3.2 km) south-southeast of Del Rio, Texas. This stream enters the Rio Grande at river mile 560.5 (902.1 km), 0.5 river mile (0.8 km) downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 877.43 feet (267.44 m) above mean sea level, U.S.C.&G.S. datum.

**RECORDS:** Based on 51 discharge measurements during the year, 40 by the United States Section and 11 by the Mexican Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: September 1931 through 1987.

**REMARKS:** Municipal diversions at Del Rio and irrigation diversions greatly modify the flow of this spring-fed creek at this station. Backwater from the Rio Grande reaches this station when the Rio Grande near Del Rio reaches a stage of 15 feet (4.6 m), or a flow of about 60,000 second-feet (1,700 m³/sec). On June 28, 1954 combined creek flow and backwater from the Rio Grande reached a stage of 24.51 feet (7.47 m), the highest of record, at this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 45,000 second-feet (1,270 m³/sec) on June 14, 1935 with a gage height of 23.20 feet (7.07 m). Min. 0.4 second-foot (0.01 m³/sec) on July 20, 1953.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily: Max.	16,200 (459)	June 14, 1935	Min. 1.5 (0.04)	July 21, 1953
Monthly: Max.	805 (22.8)	June 1935	Min. 4.6 (0.13)	July 1953
Yearly: Max.	136 (3.85)	1935	Min. 25.1 (0.71)	1953

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	116	119	117	120	119	141	106	118	133	133	121	108
2	117	119	116	118	117	172	108	118	131	132	122	107
3	118	119	116	117	116	163	112	119	129	130	123	108
4	120	118	114	118	119	143	114	112	129	128	123	110
5	121	245	115	119	114	325	119	109	127	125	121	113
6	122	135	115	114	120	225	117	106	131	126	120	113
7	121	129	117	110	113	219	115	104	127	124	121	113
8	122	127	114	108	112	170	114	105	127	119	123	116
9	119	124	115	106	113	152	120	105	128	117	123	115
10	119	122	121	105	113	146	119	101	128	118	122	116
11	119	119	119	102	113	149	110	98.0	132	115	120	121
12	117	121	120	103	109	141	113	97.5	129	116	118	125
13	117	120	120	103	105	148	113	99.4	129	119	118	125
14	117	122	120	105	104	144	112	101	126	114	121	125
15	118	122	120	106	117	140	112	99.6	123	115	120	127
16	119	121	121	107	114	140	121	100	123	116	119	125
17	120	122	122	105	113	140	121	101	122	115	119	125
18	120	123	120	107	114	136	119	105	123	116	120	126
19	121	124	121	109	117	132	121	106	121	116	119	129
20	121	124	121	119	120	126	118	109	120	117	119	129
21	120	123	129	147	124	124	120	111	115	115	119	127
22	119	122	125	130	128	115	119	114	115	116	119	127
23	120	125	122	128	132	113	116	115	115	118	118	127
24	118	135	121	131	134	113	118	113	114	116	118	125
25	118	123	123	132	133	111	119	114	115	113	114	126
26	118	123	123	129	131	113	121	115	118	112	114	124
27	117	122	122	129	128	113	124	117	117	111	112	123
28	116	119	121	128	133	113	123	151	118	113	107	123
29	118	122	122	124	136	110	118	133	131	116	108	122
30	117	121	122	120	132	115	119	131	134	123	109	121
31	121	121	121	193	193	119	119	133	121	121	121	123

Sum	3,567	3,499	4,392	3,460.5	3,685	3,744
	3,686	3,710	3,786	3,620	3,730	3,550

## Current Year 1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High			Average	Maximum	Minimum
	High	Low	Day	High	Low	Average	Maximum	Minimum	
Jan.	1.35	1.19	111	126	30	108	119	7,311	5,179
Feb.	5.89	1.20	5	1,050	2	112	127	7,075	4,296
Mar.	1.59	1.21	10	148	2	108	120	7,359	4,106
Apr.	2.07	1.11	21	221	11	95.9	117	6,940	4,421
May	3.28	1.15	31	403	12	99.2	122	7,509	5,157
June	4.68	1.13	5	719	25	104	146	8,711	5,266
July	2.35	1.11	9	256	2	98.1	117	7,180	4,460
Aug.	2.17	1.03	28	243	110	93.7	112	6,864	4,033
Sept.	1.41	1.14	29	141	21	109	124	7,398	5,276
Oct.	1.40	1.15	1	140	26	108	119	7,309	5,388
Nov.	1.34	1.22	4	127	28	105	118	7,041	4,593
Dec.	1.45	1.24	19	135	2	106	121	7,426	4,750
	5.89	1.03		1,050		93.7	122	88,123	57,025
Yearly	Meters			Cubic Meters per Second			Thousands of Cubic Meters		
	1.80	0.31		29.7		2.65	3.46	108,698	79,339
								121,050	22,451

\* Discharge measurement made on this day      ! And other days

08-4539.00 DIVERSIONS FROM THE RIO GRANDE  
MAVERICK CANAL AT MILE 13 NEAR QUEMADO, TEXAS

**DESCRIPTION:** Light-weight cableway for making current meter measurements from the bank, bubbler gage, and water-stage recorders (graphic and digital), located on the left bank of a gunnite-lined section of the canal at latitude  $29^{\circ}03'00''$ , longitude  $100^{\circ}39'40''$ , 0.5 canal mile (0.8 km) downstream from the Tequesquite Creek Siphon, 3.5 canal miles (5.6 km) upstream from the Las Moras Creek Siphon, about 7.5 miles (12.1 km) north-northwest of Quemado, Maverick County, Texas and 12.8 canal miles (20.6 km) from the canal intake. The canal intake is at river mile 543.6 (874.9 km), 17.4 river miles (28.0 km) downstream from the International highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on 24 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Gage heights at this station are affected by gate operation at Las Moras Siphon. Records available: June 21, 1949 through 1987.

**REMARKS:** At canal mile 31.8 (51.2 km) a portion of the diverted water returns to the river through the Maverick Power Plant, and the remainder enters the Maverick Canal Extension. In 1986, 10,927 acres (4,422 ha) of land were irrigated between this station and the power plant, and 27,502 acres (11,130 ha) were irrigated from the extension, making a total of 38,429 acres (15,552 ha). A total of 885,102 acre-feet (1,091,756,000 m<sup>3</sup>) returned to the Rio Grande at the power plant and through the irrigation system (see pages 50, 52, and 55).

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 1,750 second-feet (49.6 m<sup>3</sup>/sec) on August 30, 1973. Min. no flow several days in June, July, and November 1954; and October 1978.

Average Flow in Second-Feet (Cubic Meters per Second)\*

Daily:	Max. 1,730 (49.0)	August 29, 1973	Min. 0	Oct. 2 & 3, 1978
Monthly:	Max. 1,600 (45.4)	September 1981	Min. 295 (8.35)	February 1977
Yearly:	Max. 1,490 (42.2)	1980 & 1981	Min. 632 (17.9)	1972

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,540	1,530	1,480	1,480	1,300	1,470	1,490	1,470	1,520	1,530	1,460	580
2	1,550	1,520	1,450	1,510	1,300	1,420	1,500	1,490	1,520	1,520	1,470	568
3	1,530	1,510	1,480	1,500	1,320	1,460	1,530	1,480	1,530	1,550	1,460	561
4	1,530	1,510	1,470	1,490	1,350	1,460	1,540	1,490	1,510	1,530	1,470	579
5	1,520	1,510	1,470	1,480	1,410	1,460	1,540	1,480	1,500	1,530	1,470	520
6	1,530 *	1,480	1,470	1,480	1,420	1,470	1,530	1,490	1,520	1,480 *	1,480	463
7	1,580	1,500	1,460	1,350	1,420	1,460	1,380	1,480	1,520	1,380	1,490	466
8	1,570	1,510	1,460	1,130	1,430	1,460	1,440	1,510	1,330	1,540	1,490	531
9	1,580	1,500	1,470	1,260	1,400	1,460	1,440	1,490	1,440	1,570	1,500	514
10	1,590	1,490	1,470	1,370	1,410	1,460	1,450	1,490	1,490	1,570	1,510	549
11	1,590	1,500	1,490	1,450	1,390	1,490	1,460	1,480	1,520	1,580	1,500	613
12	1,580	1,490	1,490	1,440	1,380	1,510	1,470	1,470	1,540	1,580	1,510	631
13	1,270	1,480	1,490	1,440	1,390	1,530	1,430	1,470	1,520	1,570	1,510	632
14	634	1,480	1,490	1,430	1,400	1,520	1,460	1,470	1,520	1,560	1,520	641
15	53.7	1,480	1,490	1,280	1,380	1,520	1,440	1,490	1,510	1,570	1,530	645
16	146	1,470	1,480	1,180	1,370	1,530	1,450	1,500	1,530	1,560	1,530 *	721
17	708	1,470	1,470	1,200	1,400	1,510	1,460	1,480	1,520	1,550	1,520	826
18	950	1,470	1,450	1,270	1,400	1,500	1,490	1,460	1,530	1,560	1,520	835
19	1,010	1,470	1,460	1,300	1,410	1,500	1,510	1,460	1,540	1,510	1,270	811
20	1,370 *	1,470	1,490	1,340	1,440	1,510	1,500	1,420	1,530	1,440	670	811
21	1,580	1,470	1,500	1,390	1,390	1,500	1,500	1,450	1,550	1,450	692	837
22	1,610	1,460	1,510	1,360	1,410	1,500	1,500	1,470	1,520	1,430	660	858
23	1,620	1,460	1,520	1,170	1,380	1,500	1,500	1,490	1,520	1,430	639	872
24	1,620	1,470	1,520	1,130	1,400	1,490	1,500	1,510	1,510	1,430	621	868
25	1,620	1,470	1,520	1,140	1,370	1,480	1,510	1,490	1,520	1,420	607	852
26	1,630	1,470	1,530	1,320	1,360	1,490	1,510	1,480	1,550	1,410	576	852
27	1,580	1,460	1,540	1,340	1,390	1,460	1,550	1,470	1,550	1,370	586	862
28	1,110	1,460	1,520	1,240	1,360	1,480	1,500	1,460	1,540	1,370	574	863
29	1,570		1,530	1,220	1,390	1,490	1,520	1,480	1,520	1,070	558	896
30	1,590		1,530	1,300	1,410	1,480	1,500	1,520	1,520	1,330	550	912
31	1,580		1,540		1,460		1,470	1,540		1,410		921
<b>Sum</b>	41,560		39,990		44,570		45,930		45,800		22,990	
	41,921.7		46,240		43,040		46,070		45,440		34,943	

Current Year 1987

Period 1968-1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	Day			Average	Maximum	Minimum
Jan.	9.35	.59	26	1,650	15	27.4	1,350	83,150	70,633
Feb.	9.19	8.85	1 1	1,530	1 6	1,460	1,480	82,433	66,244
Mar.	9.48	8.80	127	1,540	2	1,400	1,490	91,716	75,013
Apr.	9.94	7.79	1	1,530	15	899	1,330	79,319	75,394
May	9.91	8.05	1 8	1,520	4	1,170	1,390	85,369	80,348
June	9.27	8.45	115	1,540	4	1,390	1,490	88,403	79,552
July	9.77	8.45	27	1,570	7	1,270	1,490	91,378	80,761
Aug.	9.60	8.81	31	1,550	20	1,350	1,480	91,101	81,101
Sept.	9.43	8.19	26	1,600	8	1,240	1,510	90,129	77,998
Oct.	9.34	4.92	16	1,620	29	517	1,480	90,843	76,800
Nov.	9.50	5.37	16	1,570	129	526	1,160	69,308	66,511
Dec.	7.20	4.84	31	929	7	452	713	43,815	66,395
	9.94	.59		1,650		27.4	1,360	986,964	896,750
								1,084,048	458,631
<b>Yearly</b>		<b>Meters</b>		<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>		
	3.03	0.18		46.7		0.78	38.5	1,217,400	1,106,123
								1,337,152	565,712

\*\* Period 1968-1987

\* Discharge measurement made on this day

! And other days

## 08-4550.00 PINTO CREEK NEAR DEL RIO, TEXAS

**DESCRIPTION:** Cableway, solid ledge rock and concrete control, bubbler gage, and digital water-stage recorder located on the right bank at latitude  $29^{\circ}08'45''$ , longitude  $100^{\circ}43'05''$ , 1.6 creek miles (2.6 km) from the confluence with the Rio Grande, and about 19 miles (30.6 km) southeast of Del Rio, Texas. This stream enters the Rio Grande at river mile 536.9 (864.1 km) 5.6 river miles (9.1 km) downstream from the Maverick County Water Control and Improvement District No. 1 diversion dam.

The zero of the gage is 813.68 feet (248.01 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 21 discharge measurements during the year, 11 by the United States Section and 10 by the Mexican Section of the Commission, and a continuous record of gage heights. Records available: September 1955 through 1987 at this station, and November 22, 1928 through August 1955 at a site 3.9 miles (6.3 km) upstream.

**REMARKS:** Small irrigation diversions modify the flow of this spring-fed creek at this station. When the flow in the Rio Grande at the confluence of this creek exceeds about 80,000 second-feet (2,270 m<sup>3</sup>/sec), backwater may reach this station. Backwater from the Rio Grande flood of June 1954 reached a gage height of 28.8 feet (8.78 m), or an elevation of 812.50 feet (256.79 m) above mean sea level, at this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 186,000 second-feet (5,270 m<sup>3</sup>/sec) on June 24, 1948 with a gage height of 32.0 feet (9.75 m). Min. frequently no flow.

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 28,200 (799)	June 24, 1948	Min. 0	Frequently
Monthly:	Max. 953 (27.0)	June 1948	Min. 0	Frequently
Yearly:	Max. 105 (2.97)	1932	Min. 1.3 (0.04)	1980

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	15.0	6.2	12.5	8.5	9.3	150	400	35.1	*33.9	25.9	18.9	*18.2
2	14.4	6.2	17.5	11.5	9.0	56.9	312	32.4	33.7	25.9	18.7	18.2
3	14.2	* 6.3	* 15.0	10.8	8.7	1,230	239	32.3	33.5	25.9	*19.2	18.2
4	18.2	6.4	12.6	16.1	8.5	1,360	169	*32.6	33.3	25.9	20.1	17.9
5	16.0	17.0	12.5	17.1	*66.8	1,440	110	33.4	33.1	25.9	20.9	17.4
6	*15.9	15.9	11.1	17.8	20.6	1,250	64.2	33.0	32.9	*23.5	20.9	17.5
7	12.4	12.2	10.5	*14.9	27.1	1,020	*40.5	31.2	32.7	20.9	20.6	17.4
8	12.2	10.0	10.4	11.1	14.6	956	30.0	30.2	32.5	20.0	20.6	17.4
9	12.0	8.8	10.6	11.5	11.3	913	30.8	28.8	32.3	19.1	20.4	17.8
10	11.6	8.7	12.5	9.2	10.5	958	30.8	29.4	32.1	18.9	19.9	17.8
11	11.4	9.0	14.1	7.8	10.9	929	31.5	30.0	31.9	19.1	20.1	18.2
12	12.9	9.3	12.0	8.0	10.1	859	31.5	30.8	31.7	19.1	19.9	18.2
13	11.9	9.5	11.4	7.5	8.5	829	30.8	31.7	31.5	18.7	20.8	17.6
14	12.0	9.4	12.9	6.7	8.9	813	29.9	32.6	31.3	18.7	21.6	18.8
15	12.2	9.6	12.2	6.6	9.6	808	30.0	33.1	31.1	18.2	22.1	18.6
16	8.2	9.1	12.3	6.2	9.5	790	30.8	32.4	30.9	18.6	21.9	18.5
17	4.8	9.8	13.7	5.9	9.5	783	31.7	32.4	30.7	19.4	20.1	19.5
18	10.8	9.2	12.0	5.7	9.7	782	31.7	31.4	30.5	19.6	19.7	21.4
19	11.0	9.5	12.7	5.5	11.1	776	32.3	30.0	30.4	20.1	*19.6	26.2
20	10.9	10.1	12.2	6.4	12.7	777	32.3	30.8	30.2	20.1	19.6	25.8
21	9.1	10.3	11.0	9.0	18.7	769	32.6	31.7	30.0	20.0	19.6	23.7
22	8.4	10.0	11.4	9.6	14.6	771	32.2	32.6	*20.1	19.6	21.7	
23	8.4	9.7	11.4	9.0	12.6	772	31.7	32.1	29.6	20.1	19.4	21.6
24	9.1	17.4	10.4	8.7	11.8	768	32.4	22.3	22.3	21.1	20.0	22.6
25	9.1	16.7	10.7	9.8	11.5	770	32.6	22.6	29.4	21.6	20.0	23.6
26	9.1	14.4	11.0	11.5	11.2	769	32.6	23.1	29.0	21.9	19.6	23.1
27	11.0	12.5	10.8	10.9	11.7	804	33.5	*23.7	28.8	21.0	19.1	23.1
28	9.1	11.8	11.0	10.5	12.8	715	34.4	23.7	28.6	20.1	18.7	23.4
29	9.0		10.1	10.2	*38.0	588	34.4	24.2	28.4	20.6	18.2	24.2
30	9.0		9.8	9.6	24.7	483	35.3	24.7	28.2	20.5	18.2	24.2
31	7.9		*10.1		76.2	*36.0	25.3			19.8		24.5
<b>Sum</b>	295.0	293.6	347.2	368.4	530.7	24,688.9	2,106.5	919.6	650.3	931.2	598.0	636.3

## Current Year 1987

## Period 1929-1987

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	1.39	0.84	4	25.9	17	3.6	11.2	689	551	2,270
Feb.	1.67	.98	5	41.3	1 1	6.2	10.5	585	585	5,760
Mar.	1.29	.97	2	20.1	16	7.9	11.9	731	523	2,500
Apr.	1.31	.93	1 5	17.8	20	5.1	9.8	582	1,203	27,100
May	3.38	1.26	31	519	13	7.6	17.1	1,053	1,894	29,400
June	5.91	1.25	3	2,540	1	14.1	823	48,970	4,080	56,700
July	3.84	1.48	7	726	1 7	29.4	68.0	4,178	1,449	30,000
Aug.	1.48	1.08	1	35.3	24	22.1	29.7	1,824	1,526	48,700
Sept.			1 6	33.9	30 0	28.2	31.0	1,847	2,110	48,965
Oct.	1.48	1.26	1 1	25.9	115	16.5	21.0	1,290	1,065	8,940
Nov.	1.34	1.26	1 14	22.1	1 1	18.2	19.9	1,186	503	2,590
Dec.	1.41	1.24	19	27.0	1 5	17.4	20.5	1,262	580	2,470
				2,540		3.6	88.7	64,197	16,069	76,259
<b>Yearly</b>	<b>Meters</b>			<b>Cubic Meters per Second</b>		<b>Thousands of Cubic Meters</b>				
				71.9	0.10	2.51	79,186	19,821	94,064	1,169

\* Discharge measurement made on this day

0 Mean daily

! And other days

## 08-4555.00 RIO SAN DIEGO NEAR JIMENEZ, COAHUILA

**DESCRIPTION:** Cableway, masonry and concrete Cipolletti weir of 777 second-foot (22 m<sup>3</sup>/sec) capacity, gravity well, and water-stage recorder located on the left bank of Rio San Diego, and gravity well and water-stage recorder on Agualega de Dolores, an irrigation canal that runs along the left bank of the river under the cable, located at latitude 29° 04' 20", longitude 100° 47' 35", about 3.5 miles (6 km) west of Jimenez, Coahuila, and 4.1 river miles (7 km) from the confluence with the Rio Grande. Part of the canal flow measured here returns to the river downstream. This stream enters the Rio Grande at river mile 532.2 (856.4 km), 10.4 river miles (16.8 km) downstream from Maverick County Water Control and Improvement District No. 1 diversion dam and 28.9 river miles (46.4 km) downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 831.73 feet (253.51 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** For the river, based on the weir discharge table and a continuous record of gage heights; and for the canal, on 23 discharge measurements during the year, and a continuous record of gage heights. The flow tabulated below includes the flow of the canal, and prior to 1964, records do not include this flow. During 1987 the capacity of the weir was exceeded on May 29 and 31, June 1 through 27. Records available: 1922 through 1987. Records from 1922 through September 1932 are considered doubtful.

**REMARKS:** Reservoirs and irrigation diversions upstream from these stations modify the flow of this spring-fed stream. On December 24, 1955, the zero of the gage was raised 2.62 feet (0.80 m); in November 1961 an additional 0.20 foot (0.06 m), and the capacity of the weir was increased from 706 (20 m<sup>3</sup>/sec) to 777 second-feet (22 m<sup>3</sup>/sec).

**EXTREME FLOWS FROM RECORDS\*\*** Momentary: Max. 81,930 second-feet (2,320 m<sup>3</sup>/sec) on June 17, 1961 with a gage height of 20.70 feet (6.31 m). Min. no flow occurred on several occasions.

## Average Flow in Second-Feet (Cubic Meters per Second)\*\*\*

Daily:	Max. 36,700 (1,040)	July 18, 1975	Min. 0	Occasionally
Monthly:	Max. 2,380 (67.5)	Oct. 1932	Min. 8.0 (0.23)	July 1956
Yearly:	Max. 622 (17.6)	1976	Min. 24.0 (0.68)	1956

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	406	309	346	284	353	830	720	629	484	526	448	351
2	406	307	345	284	364	653	720	622	470	526	441	351
3	396	304	344	280	364	713	699	618	480	523	431	351
4	385	309	334	256	360	689	685	607	491	516	427	351
5	406	374	330	245	345	2,440	671	607	505	512	399	350
6	399	343	324	245	341	1,560	660	572	516	505	399	345
7	392	353	322	239	340	1,190	657	569	526	498	385	345
8	385	374	321	231	331	1,270	646	558	540	498	396	347
9	378	381	316	222	347	1,180	650	558	551	484	378	338
10	371	410	325	218	360	1,120	636	558	558	484	374	353
11	364	406	340	208	374	1,120	632	599	572	484	385	360
12	357	399	326	208	371	1,050	632	494	569	484	385	353
13	367	399	323	207	371	1,030	629	487	569	477	410	344
14	367	399	326	207	374	1,030	611	477	565	470	424	329
15	357	381	322	207	378	1,020	604	473	558	456	420	317
16	357	378	314	202	392	1,000	643	473	554	448	413	311
17	357	381	353	196	399	971	646	477	562	448	406	337
18	353	381	338	187	399	986	660	477	551	448	399	351
19	346	388	327	182	396	932	657	470	547	448	399	357
20	346	388	325	188	326	904	643	470	551	431	399	346
21	342	381	322	208	319	883	632	466	551	424	392	339
22	334	378	318	209	312	876	632	466	523	424	392	339
23	327	374	302	215	331	868	653	487	523	431	392	339
24	329	396	302	292	348	816	657	491	523	424	385	339
25	319	378	305	340	342	780	646	484	509	424	385	332
26	316	374	300	353	342	773	646	487	501	431	385	328
27	314	364	280	353	360	784	650	484	501	434	381	328
28	319	352	273	353	374	749	643	537	501	434	367	324
29	319	319	273	353	1,570	773	639	519	537	434	364	317
30	314	281	272	353	622	735	629	484	530	441	360	314
31	314	281	1,400	477	632	477				448	309	309
<b>Sum</b>	10,361	9,829	7,525	29,675	20,160	16,087	15,918	14,415	11,921			
	11,042			13,605								

## Current Year 1987

## Period 1933-1987

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	.85	.72	! 1	406	127	314	357	21,900	8,765	36,430
Feb.	.89	.59	5	448	2	292	371	20,558	6,522	25,760
Mar.	.79	.62	17	381	128	263	317	19,497	5,757	27,040
Apr.	.75	.46	125	353	20	174	251	14,928	6,770	40,270
May	3.15	.69	31	3,570	120	309	438	26,993	11,048	120,200
June	3.48	1.12	5	4,130	2	622	989	58,880	12,081	108,300
July	1.21	1.08	1	720	15	597	650	39,989	14,035	136,149
Aug.	1.12	.89	1	636	121	452	519	31,905	11,583	91,248
Sept.	1.12	.92	10	639	1	470	530	31,569	16,714	94,667
Oct.	.98	.85	1	526	120	424	466	28,592	18,833	71,830
Nov.	.89	.75	1	448	30	352	399	23,648	13,509	64,060
Dec.	.75	.69	11	360	116	292	339	20,816	9,618	45,320
	3.48	.46		4,130		174	470	339,275	135,635	451,952
<b>Yearly</b>	<b>Meters</b>			<b>Cubic Meters per Second</b>		<b>Thousands of Cubic Meters</b>				
	1.06	0.14		117		4.93	13.3	413,491	156,395	557,477
								! Discharge measurement made on this day		! And other days

\*\* Period October 1932-1987

## 08-4557.00 RIO GRANDE NEAR JIMENEZ, COAHUILA AND QUEMADO, TEXAS

**DESCRIPTION:** Cableway, bubbler gage, control weir of 1,270 second-foot (36 m<sup>3</sup>/sec) capacity, gravity well, and water-stage recorder located on the right bank at latitude 29° 03' 00", longitude 100° 39' 50", and river mile 530.3 (853.5 km); 1.5 miles (2.4 km) south-southeast of Jimenez, Coahuila, 1.8 river miles (3.0 km) downstream from Rio San Diego, about 7.5 miles (12.1 km) north-northwest of Quemado, Maverick County, Texas, 12.3 river miles (19.8 km) downstream from the Maverick County Water Control and Improvement District No. 1 diversion dam, and 30.7 river miles (49.4 km) downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 769.00 feet (234.39 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 30 discharge measurements during the year, 22 by the Mexican Section and 8 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods prior to completion of the weir and for flows exceeding the capacity of the weir thereafter. Computations for flows within the capacity of the weir were based on a stable control weir rating curve defined by meter measurements. Records available: 1965 through 1987. Records, excluding some high flow periods, are also available from 1956 through May 1965 for a station 8.1 river miles (14 km) upstream. Records prior to 1976 were published under title "Rio Grande below Maverick Dam near Quemado, Texas."

**MARKS:** This station was placed in operation January 1, 1965 and replaces the station "Rio Grande below Maverick Dam near Del Rio, Texas," which stopped operating June 1, 1965. Irrigation diversions 13.3 river miles (21.5 km) upstream largely control the flow at this station. The weir was placed in operation June 1, 1967, and the zero of the gage was set 3.28 feet (1 m) higher.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 79,800 second-feet (2,260 m<sup>3</sup>/sec) on July 18, 1975 with a gage height of 25.20 feet (7.68 m). Min. 2.8 second-feet (0.08 m<sup>3</sup>/sec) several days in April 1983 with a gage height of 0.20 foot (0.06 m).

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily: Max. 67,100 (1,900)	July 18, 1975	Min. .28 (0.08)	April 25 and 26, 1983
Monthly: Max. 21,300 (602)	Sept. 1974	Min. 28.3 (0.80)	June 1969
Yearly: Max. 4,380 (124)	1974	Min. 286 (8.11)	1968

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,340	3,140	2,750	2,080	908	2,710	4,340	4,060	"060	1,410	1,310	445
2	1,370	2,610	2,840	1,590	918	1,666	4,310	4,060	3,920	2,190	1,300	438
3	1,330	2,610	2,810	1,560	936	1,920	4,240	4,060	3,850	1,770	1,310	438
4	1,330	2,660	2,810	1,530	802	1,790	4,200	4,060	4,310	1,380	1,320	438
5	1,330	3,260	2,830	1,590	1,450	4,800	4,170	4,100	3,990	1,380	1,300	438
6	1,350	2,960	2,830	1,580	886	4,800	4,170	3,960	3,990	1,550	1,260	445
7	1,350	2,840	2,830	1,380	1,190	2,550	2,910	3,960	3,990	2,390	1,380	438
8	1,350	2,840	2,850	943	1,220	2,300	2,010	3,920	4,340	2,260	1,410	438
9	1,360	2,840	2,800	636	770	2,040	1,970	3,960	"060	2,220	1,380	424
10	1,310	2,870	2,780	1,010	745	2,980	2,140	4,060	4,060	2,240	1,320	434
11	1,310	2,720	2,810	1,350	763	3,810	1,950	3,920	4,030	2,230	1,330	438
12	1,330	3,060	2,560	1,410	720	3,600	1,920	3,880	3,740	2,200	1,350	438
13	1,600	2,890	2,890	1,380	689	3,510	1,900	3,850	3,480	2,270	1,410	431
14	2,200	2,860	2,690	1,360	685	3,510	1,910	3,880	3,460	2,610	1,420	427
15	2,760	2,880	2,760	1,250	759	3,460	1,910	3,850	2,740	2,290	1,370	406
16	3,880	2,830	2,790	805	773	4,520	1,900	3,850	1,690	2,160	1,330	904
17	4,800	2,840	2,930	809	724	4,590	1,920	3,810	1,630	1,370	1,330	625
18	4,520	2,810	2,630	706	720	4,590	2,880	3,400	1,450	1,340	1,330	706
19	4,410	2,800	2,880	685	939	4,590	3,530	3,400	1,480	1,250	840	777
20	4,030	2,810	2,700	682	777	4,560	3,570	3,390	1,490	957	547	745
21	3,920	2,750	2,690	922	795	4,520	3,920	3,280	1,390	918	491	713
22	3,880	2,770	2,690	897	703	4,520	3,920	3,260	1,360	915	480	678
23	3,880	2,780	2,650	926	731	3,880	3,920	3,290	1,360	985	494	611
24	3,880	2,930	2,630	1,070	742	4,300	3,920	2,660	1,440	964	516	607
25	3,850	2,810	2,620	1,130	742	4,310	4,030	1,640	1,410	996	530	618
26	3,850	2,820	2,650	968	1,360	4,200	4,100	1,640	1,630	961	480	597
27	3,990	2,830	2,610	918	766	4,380	4,170	1,660	1,400	893	473	576
28	4,340	2,790	2,600	964	766	4,270	4,130	2,140	1,340	879	452	597
29	3,880		2,600	1,020	3,020	4,380	4,100	2,680	1,480	1,230	452	569
30	3,880		2,600	915	1,210	4,410	3,990	4,100	1,460	918	452	551
31	3,880		3,090	5,540				4,100	4,130	1,010		554
<b>Sum</b>	79,610		34,076		111,540		107,810		48,136		16,944	
	88,490		85,200		33,749		102,150		79,990		30,367	

## Current Year 1987

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Period 1968-1987				
	High		Low	Day	High			Average	Maximum	Minimum		
	High	Low		Day	Day							
Jan.	3.38	1.61	16	5,650	1,3	1,290	2,860	175,590	48,569	175,590		
Feb.	3.05	1.84	6	4,590	1,2	1,590	2,840	157,904	79,674	401,339		
Mar.	3.02	1.80	17	4,560	29	1,550	2,750	168,984	92,462	292,726		
Apr.	2.72	.72	1	3,600	20	348	1,140	67,580	74,090	320,444		
May	7.05	.89	31	15,800	122	466	1,090	66,942	152,194	493,189		
June	5.38	1.31	15	11,100	3	893	3,710	221,259	103,429	291,767		
July	3.02	1.18	1	4,520	16	749	3,290	202,578	100,020	311,781		
Aug.	2.92	1.84	31	4,240	125	1,590	3,480	213,800	121,209	710,869		
Sept.	3.31	1.64	4	5,510	122	1,310	2,670	158,681	158,038	11,855		
Oct.	3.02	.95	14	4,560	121	523	1,550	95,485	131,603	1,264,108		
Nov.	1.77	.85	14	1,520	127	452	1,010	60,239	70,827	149,143		
Dec.	2.17	.75	16	2,190	15	360	547	33,608	44,272	181,109		
	7.05	.72		15,800		348	2,250	1,622,650	1,176,387	3,169,805		
<b>Yearly</b>	<b>Meters</b>			<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>					
	2.15	0.22		466		9.86	63.6	2,001,517	1,453,233	3,909,913		
										256,561		

\* Discharge measurement made on this day

! And other days

## 08-4571.00 RIO SAN RODRIGO AT EL MORAL, COAHUILA

**DESCRIPTION:** Gravity well and water-stage recorder located on the left bank of El Moral, Coahuila, latitude 28°53'20", longitude 100°37'55", 1.0 river mile (1.6 km) from the confluence with the Rio Grande, and about 15.5 miles (25 km) northwest of Piedras Negras, Coahuila. This stream enters the Rio Grande at river mile 518.2 (834.0 km), 24.4 river miles (39.3 km) downstream from the Maverick County Water Control and Improvement District No. 1 diversion dam and 21.9 river miles (35.2 km) upstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila. The zero of the gage is 750.95 feet (228.89 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 24 discharge measurements during the year, 24 by the Mexican Section and 0 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1962 through 1987.

**REMARKS:** Prior to 1976 this station was published under the heading "Rio San Rodrigo near Mouth at El Moral, Coahuila." The flow of this spring-fed stream is modified by diversions above this station. The concrete control weir, placed in operation on November 25, 1969, was destroyed by the flood of July 12, 1976, and the station was relocated on October 15, 1976.

**EXTREME FLOWS FROM RECORDS\*\*:** Momentary: Max. 140,000 second-feet (3,970 m<sup>3</sup>/sec) on July 18, 1975 with a gage height of 18.44 feet (5.62 m). Min. frequently no flow.

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 44,500 (1,260)	July 18, 1975	Min. 0	Frequently
Monthly:	Max. 7,380 (209)	July 1976	Min. 0	Frequently
Yearly:	Max. 837 (23.7)	1976	Min. 5.3 (0.15)	1963

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	219	170	150	96.1	105	1,050	897	473	1,790	417	262	258
2	215	162	145	91.1	110	1,090	855	441	1,550	374	271	258
3	212	162	142	87.6	112	1,110	805	413	1,300	344	280	257
4	210	157	139	86.2	114	1,080	766	403	1,170	322	281	246
5	206	225	144	86.2	107	1,720	731	381	1,080	364	281	242
6	205	251	143	86.2	106	2,010	696	367	1,000	385	279	258
7	205	203	139	86.2	111	4,590	653	448	943	378	277	251
8	205	185	139	86.2	111	3,480	614	565	886	367	281	246
9	205	176	136	83.3	111	2,860	600	477	826	353	277	246
10	202	170	133	83.3	111	2,800	579	318	752	353	275	246
11	201	166	141	80.5	112	2,660	540	233	777	353	251	246
12	198	166	139	78.4	115	2,740	519	143	819	353	240	241
13	195	163	139	74.9	114	2,650	484	147	731	360	252	240
14	196	162	139	72.4	118	2,410	445	132	562	360	259	237
15	198	157	139	71.3	138	2,200	438	115	537	360	266	203
16	197	155	139	71.3	149	1,900	501	93.2	523	360	268	191
17	200	153	139	71.3	239	1,640	5,790	131	487	360	268	230
18	197	148	135	71.3	259	1,420	4,730	164	459	360	268	230
19	196	147	128	69.2	264	1,270	3,710	120	604	349	268	230
20	196	148	123	68.2	246	1,170	3,280	115	696	330	245	226
21	193	148	121	75.6	237	1,100	2,640	117	664	322	246	224
22	188	148	117	82.6	245	1,180	2,580	112	579	319	254	224
23	186	149	112	83.3	229	1,080	2,490	106	533	316	266	224
24	183	158	109	91.1	215	1,010	2,500	99.6	498	316	268	223
25	178	166	107	128	200	939	2,450	321	501	314	268	211
26	173	165	107	121	188	897	2,400	544	565	310	268	214
27	171	161	107	108	182	961	1,640	766	431	304	268	214
28	171	156	103	103	174	1,050	565	989	333	298	257	251
29	167	95.3	103	554	554	989	558	1,210	371	292	258	219
30	170	93.2	103	583	932	519	1,430	470	268	268	258	219
31	171	96.4		1,250		501	1,650	501	262			217
<b>Sum</b>	<b>4,677</b>	<b>2,599.8</b>		<b>51,988</b>		<b>13,023.8</b>		<b>10,523</b>		<b>7,222</b>		
	<b>6,010</b>	<b>3,938.9</b>		<b>6,909</b>		<b>46,476</b>		<b>22,337</b>		<b>7,960</b>		

## Current Year 1987

## Period 1962-1987

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	2.03	1.87	1	221	29	166	194	11,921	3,462	13,281
Feb.	2.30	1.77	5	304	118	144	167	9,277	2,478	9,932
Mar.	1.90	1.57	11	176	129	92.9	127	7,826	2,019	7,826
Apr.	1.74	1.44	125	131	119	68.2	86.9	5,159	3,736	29,072
May	5.61	1.61	31	2,180	1	103	223	13,707	4,155	29,277
June	9.19	3.61	7	5,580	26	883	1,730	103,142	6,785	103,142
July	10.66	2.62	17	7,350	14	431	1,500	92,187	32,372	454,643
Aug.	4.86	1.44	31	1,650	16	71.3	420	25,841	11,325	89,017
Sept.	4.49	1.77	1	1,970	28	316	745	44,299	15,953	48,065
Oct.	2.13	1.61	1	463	31	258	310	20,881	13,627	53,088
Nov.	1.67	1.41	3	281	20	198	266	15,793	9,441	84,015
Dec.	1.77	1.08	28	316	16	106	233	14,326	5,465	19,970
	10.66	1.08		7,350		68.2	501	364,359	110,818	606,526
<b>Yearly</b>	<b>Meters</b>			<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>			
	3.25	0.33		208		1.93	14.2	449,432	136,690	748,140

\*\* Period 1961-1987

\* Discharge measurement made on this day

! And other days

08-4575.00 RETURN FLOW TO THE RIO GRANDE FROM THE MAVERICK CANAL  
AT MAVERICK POWER PLANT NEAR EAGLE PASS, TEXAS

**DESCRIPTION:** A part of the water diverted from the river into the Maverick Canal is returned to the Rio Grande through the hydroelectric power plant located on the left bank of the Rio Grande at latitude 28°49'50", longitude 100°33'10", about 9 miles (14.5 km) north-northwest of Eagle Pass, Texas, and about 32.2 canal miles (51.8 km) downstream from the point of diversion. The return enters the Rio Grande at river mile 506.8 (815.6 km).

**RECORDS:** Based on records furnished by the Maverick County Water Control and Improvement District No. 1, showing hourly discharge in cubic feet per second based on hourly manometer readings, through each turbine at the Central Power and Light Company hydroelectric power plant. The mean daily discharges computed from the manometer readings have been multiplied by a factor to make them agree with periodic current meter measurements of flows made under stable flow conditions by hydrographers of the Commission. There were 47 discharge measurements made during the year. Records available: 1949 through 1987.

**REMARKS:** This power plant began operating April 16, 1932 with hydroelectric power generating facilities for 12,000 kw. Because the September 1932 flood washed out the upper end of the Maverick Canal, this plant did not operate from September 2, 1932 until March 17, 1937. Since then it has operated continuously except for 44 days in 1953 when shortage of water prevented operation, and from June 30 through July 19 during flood of 1954, and while the canal was being repaired. The plant's operation is now governed by the amount of water released from Amistad Reservoir, which began operations on May 31, 1968.

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max. 1,580 (44.7)	February 28, 1982	Min. 0	Occasionally
Monthly:	Max. 1,530 (43.3)	January 1985	Min. 42.4 (1.20)	December 1971
Yearly:	Max. 1,230 (34.8)	1981	Min. 232 (6.57)	1972

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,440	1,400	1,430	1,280 ■	1,140	1,360	1,310 ■	1,310	1,310 ■	1,330	1,310	481 ■
2	1,410	1,380 ■	1,410	1,310	1,130	1,300	1,320	1,340	1,310 ■	1,310	1,310	478
3	1,450	1,370	1,420 ■	1,280	1,150	1,290	1,340	1,290	1,310 ■	1,330	1,290	464
4	1,450	1,370	1,390	1,290 ■	1,180 ■	1,360 ■	1,360	1,260	1,320	1,350	1,270	450
5	1,450	1,420	1,400	1,330	1,240	1,340	1,360	1,250	1,330	1,340	1,270	455
6	1,440 ■	1,390	1,410	1,320 ■	1,300	1,370	1,340 ■	1,280	1,350	1,270	1,260	360
7	1,450	1,420	1,390	1,300	1,250	1,360	1,190	1,270	1,320	1,180	1,300	259
8	1,440	1,430	1,390	1,070	1,260	1,380	1,140	1,310	1,250 ■	1,290	1,330	225
9	1,430	1,420	1,400	1,110	1,260	1,370	1,380	1,330	1,240	1,350	1,310	279 ■
10	1,440	1,410	1,400 ■	1,180	1,260	1,360 ■	1,200	1,420	1,300	1,350	1,290	270
11	1,440	1,420	1,440	1,310	1,270 ■	1,390	1,200	1,180 ■	1,320	1,380	1,300	331
12	1,430	1,410 ■	1,440	1,330	1,260	1,390	1,240	1,260	1,360	1,340	1,290 ■	374
13	1,260	1,400	1,440	1,280	1,260	1,360	1,200 ■	1,280	1,350	1,310 ■	1,310	419
14	842	1,410	1,450	1,250	1,290	1,430	1,180	1,270	1,330	1,300	1,350	410
26	263	1,420	1,430	1,220 ■	1,260	1,410	1,180	1,300	1,320 ■	1,300	1,390	409 ■
16	114	1,410	1,410	1,020	1,250	1,420	1,200	1,330	1,340	1,300	1,340	476
17	0	1,420 ■	1,390 ■	990	1,260	1,410 ■	1,230	1,290 ■	1,340	1,280	1,320	616
18	828	1,410	1,390	1,050	1,260 ■	1,400	1,270	1,230	1,340	1,310	1,330 ■	702
19	863	1,420	1,360	1,110	1,270	1,400	1,320	1,210	1,340	1,270 ■	1,230	676
20	1,150	1,410	1,400	1,080 ■	1,270	1,410	1,290 ■	1,180	1,360	1,170	516	671
21	1,420 ■	1,410	1,410	1,090	1,290	1,440 ■	1,260	1,190	1,340 ■	1,220	481	666
22	1,420	1,410	1,410	1,160	1,280	1,440 ■	1,210	1,210	1,320	1,190	520	680 ■
23	1,420	1,400	1,410 ■	1,000	1,260	1,470	1,280	1,280	1,290	1,270	474	716
24	1,430	1,410	1,390	993	1,260	1,470	1,280	1,260	1,270	1,240	444 ■	739
25	1,430	1,420	1,340	942	1,250	1,450	1,300	1,220 ■	1,270	1,260	428	740
26	1,430 ■	1,420 ■	1,350	1,100	1,230 ■	1,460	1,330	1,220	1,320	1,240 ■	439	744
27	1,410	1,410	1,380	1,160	1,240	1,430 ■	1,340	1,230	1,340	1,190	469	756
28	903	1,400	1,400	1,130	1,210	1,410	1,300	1,230	1,310	1,160	466	746
29	1,330		1,370	1,090	1,250	1,350	1,300	1,260	1,300	1,020	463	767
30	1,390		1,340	1,090	1,280	1,320	1,300	1,300	1,310	1,060	451	786
31	1,400		1,320		1,350			1,300	1,320	1,230		807
<b>Sum</b>	<b>39,420</b>	<b>34,865</b>	<b>41,720</b>	<b>39,310</b>	<b>39,510</b>	<b>39,140</b>	<b>16,952</b>					
	37,573.0	43,310	38,720	39,500	39,510	29,951						

**Current Year 1987**

**Period 1968-1987**

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	Day			Average	Maximum	Minimum
Jan.			1 3	1,450	17	0	1,210	74,525	55,706
Feb.			8	1,430	1 3	1,370	1,410	78,188	52,012
Mar.			14	1,450	1 3	1,320	1,400	85,904	53,456
Apr.			112	1,330	25	942	1,160	69,154	51,386
May			31	1,350	2	1,130	1,250	76,800	59,783
June			123	1,470	2	1,300	1,390	82,750	54,847
July			9	1,380	8	1,140	1,270	78,347	82,750
Aug.			10	1,420	111	1,180	1,270	77,970	6,618
Sept.			112	1,360	9	1,240	1,320	78,367	78,637
Oct.			11	1,380	29	1,020	1,260	77,633	5,537
Nov.			15	1,390	25	428	998	59,407	53,156
Dec.			31	807	8	225	547	33,624	11,147
<b>Yearly</b>	<b>Meters</b>		<b>Cubic Meters per Second</b>		<b>Thousands of Cubic Meters</b>				
				41.6		0	34.3	1,076,420	814,817
								1,096,624	207,661

\*\* Period 1968-1987

\* Discharge measurement made on this day

Ø Mean daily

! And other days

08-4576.00 MAVERICK CANAL EXTENSION BELOW THE POWER PLANT  
NEAR EAGLE PASS, TEXAS

**DESCRIPTION:** Gage well and digital water-stage recorder located on the downstream side of a wooden pile bridge at latitude 28°49'50", longitude 100°32'40", about 1 mile (1.6 km) downstream from the heading of this canal extension, about 9 miles (14.5 km) north-northwest of Eagle Pass, Texas, and about 32.8 canal miles (52.8 km) downstream from the point of diversion from the Rio Grande, which is located at river mile 543.6 (874.9 km). The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on 24 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1939 through 1987.

**REMARKS:** The main Maverick Canal divides into two branches at a point about 9 miles (14.5 km) north-northwest of Eagle Pass, Texas, and about 31.8 canal miles (51.2 km) downstream from the point at which water from the Rio Grande is diverted. One branch leads to the Maverick Power Plant and back to the Rio Grande, while the other branch forms this Maverick Canal Extension, which is used to transmit irrigation water. Irrigation from this canal extension began in June 1938. In 1986, 27,502 acres (11,130 ha) of land north and south of Eagle Pass were irrigated. A total of 12,381 acre-feet (15,272,000 m<sup>3</sup>) of water from this canal extension returned to the river through the irrigation system which extends approximately 67 canal miles (108 km) downstream.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 580 second-feet (16.4 m<sup>3</sup>) on July 25, 1964. Min. occasionally no flow.

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max. 552 (15.6)	June 6 & 7, 1968	Min. 0	Occasionally
Monthly:	Max. 507 (14.9)	June 1968	Min. 18.0 (0.51)	January 1985
Yearly:	Max. 294 (8.33)	1972	Min. 58.2 (1.65)	1986

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	36.9	74.1	32.5	* 80.2	54.6	61.0	130 *	90.3	* 97.0	99.0	89.3	101 *	
2	37.1	* 76.8	32.4	80.1	58.4	59.8	110	90.1	96.5	100	* 88.3	96.0	
3	37.4	74.8	* 33.3	77.9	60.2	55.3	95.5	89.2	93.9	101	87.3	96.7	
4	38.1	72.6	36.7	76.0	* 59.1	* 51.5	95.5	* 90.6	91.6	103	88.5	96.5	
5	38.3	62.3	36.3	76.0	59.0	54.5	96.2	91.2	84.3	100	88.0	98.7	
6	*	39.0	53.3	33.8	75.7	55.6	53.4	96.2	90.3	73.4	* 97.4	89.3	99.0
7	39.7	51.4	34.1	70.6	56.9	51.9	97.0	89.4	73.3	95.6	90.8	95.9	95.9
8	39.3	49.7	34.2	64.4	61.6	42.0	106	88.8	72.8	94.6	92.1	97.6	97.6
9	38.8	50.5	34.4	70.0	63.7	41.4	115	87.6	67.1	93.6	95.7	105	105
10	38.6	53.4	32.6	72.7	64.4	42.1	122	86.6	50.2	92.3	99.7	104	104
11	38.2	51.5	27.9	71.2	61.1	42.1	128	85.1	78.0	91.3	98.5	105	105
12	37.7	49.7	28.1	71.0	58.1	48.1	128	84.3	92.5	94.2	99.7	106	106
13	42.4	48.0	28.1	71.7	59.0	57.0	125 *	86.1	92.1	95.8	95.9	107	107
14	47.3	43.2	28.4	74.1	59.7	57.9	118	84.8	91.1	94.9	93.2	106	106
15	28.1	36.5	32.7	* 79.6	60.3	58.6	120	84.7	* 77.5	93.7	94.3	109 *	109 *
16	2.8	35.0	37.4	81.6	61.4	59.4	124	* 85.2	71.5	92.6	* 95.0	113	113
17	6.0	*	33.6	37.4	82.0	62.5	* 60.1	115	* 83.8	73.3	91.4	* 96.2	114
18	13.0	33.5	38.8	80.8	* 63.2	62.4	105	86.0	74.1	90.8	96.5	112	112
19	17.7	33.5	40.3	79.8	63.2	65.0	103	92.3	76.0	* 95.4	96.3	111	111
20	28.3	33.3	41.9	79.7	63.6	67.8	101	95.0	77.4	93.3	95.4	111	111
21	*	28.3	33.2	43.5	79.5	64.4	70.4	97.8	95.5	84.7	89.4	96.1	111
22	36.2	33.0	45.3	75.7	63.4	60.8	95.4	96.1	94.0	99.9	96.5	111	111
23	43.4	33.0	46.9	73.5	63.5	9.8	94.2	97.1	97.9	97.6	97.0	112	112
24	45.5	33.0	56.4	72.1	63.1	1.2	92.6	97.2	99.7	94.7	99.1	111	111
25	47.8	32.7	78.5	67.3	62.8	1.5	91.0	97.9	101	92.4	103	108	108
26	53.6	32.7	77.1	60.5	62.6	2.3	89.9	98.2	103	92.2	103	101	101
27	59.9	32.6	66.4	56.4	62.0	4.2	91.1	98.6	104	91.6	103	101	101
28	62.1	32.6	63.8	51.8	61.4	33.4	91.3	98.8	106	91.0	104	102	102
29	65.2		67.2	48.7	61.2	120	90.3	98.5	101	89.8	105	102	102
30	68.2		71.7	53.3	60.8	134	90.0	98.2	97.6	89.3	104	102	102
31	71.4		76.5		60.6	91.2	98.0			89.6		96.6	
<b>Sum</b>		1,279.5		2,153.9		1,528.9		2,835.7		2,927.4		3,242.0	
	1,226.3		1,374.6		1,891.4		3,245.2		2,592.8		2,880.7		

**Current Year 1987**

**Period 1968-1987**

Month	Average Rainfall Inches***			Extreme Second-Feet		Average Second- Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Low	Day		Average	Maximum	Minimum	
Jan.	.78	.86	31	71.4	1.2	17	39.6	2,432	9,311	18,236	
Feb.	.89	2.36	2	76.9	28	32.3	45.7	2,538	8,594	18,006	
Mar.	.63	.82	26	80.1	11	27.8	44.3	2,726	13,494	23,397	
Apr.	1.79	2.52	15	84.2	29	48.7	71.8	4,272	15,201	25,900	
May	3.12	5.60	21	70.0	1	51.8	61.0	3,752	12,945	28,191	
June	2.34	8.36	30	135	24	0.8	51.0	3,033	15,304	30,173	
July	1.41	1.86	1	136	27	88.3	105	6,437	17,227	28,854	
Aug.	2.00	1.41	27	99.7	15	83.1	91.5	5,625	15,799	24,335	
Sept.	2.78	1.01	29	107	10	44.6	86.4	5,143	10,408	17,691	
Oct.	2.22	0	22	109	129	88.6	94.4	5,806	9,347	16,504	
Nov.	.77	.36	30	106	2	86.4	96.0	5,714	9,247	18,794	
Dec.	.73	.92	117	114	31	92.8	105	5,430	8,928	16,824	
<b>Yearly</b>	19.46	26.08		136		0.8	74.5	53,908	145,805	213,138	42,170
	Millimeters			Cubic Meters per Second				Thousands of Cubic Meters			
	494.3	662.4		3.85		0.02	2.11	66,494	179,848	262,901	52,016

\*\* Period 1968-1987 \* Discharge measurement made on this day

! And other days

\*\*\* On the United States side from Maverick Power Plant to Cuervo Creek

08-4577.00 RETURN FLOW TO THE RIO GRANDE  
FROM THE MAVERICK IRRIGATION DISTRICT  
ABOVE EAGLE PASS, TEXAS

**DESCRIPTION:** Part of the water diverted from the Rio Grande into the Maverick Canal is returned to the river through various drains and spillways of the irrigation system located between Maverick Diversion Dam and Eagle Pass, Texas. These return flows are measured at gaging stations consisting of sharp-crested Cipolletti weirs or control structures equipped with continuous water-stage recorders located at Hughes Ranch, gate leakage at Las Moras Creek, Lateral 1, Lateral 2 Spill, Canon Grande, Quemado Creek, Lateral 15 Spill, Houchin Spill, Lateral 12 Spill, Elm Creek, and Seco Creek; and a Parshall flume at the Lateral 2 Sand Trap Spill into Las Moras Creek immediately below the canal siphon.

**RECORDS:** Based on the weir discharge table and a continuous record of gage heights. All storm flow occurring at these stations is deducted from the records and is not shown below. Records available: April 1959 through 1987. Records prior to 1976 were published under the title "Return Flow to the Rio Grande from Maverick Canal-Maverick Dam to Eagle Pass, Texas."

**REMARKS:** In addition to the flows listed below, water from the Maverick Canal is returned to the Rio Grande in this reach at the Maverick Power Plant (see page 50).

**EXTREME FLOWS FROM RECORDS:**

				Average Flow in Second-Feet (Cubic Meters per Second)*											
Daily:	Max.	929 (26.3)	Sept. 29, 1975	Min.	2.4 (0.07)	August 4 & 8, 1985									
Monthly:	Max.	154 (4.36)	June 1968	Min.	4.9 (0.14)	September 1985									
Yearly:	Max.	126 (3.57)	1968	Min.	14.4 (0.41)	1985									

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	24.5	14.9	16.5	25.9	24.7	18.8	11.2	23.4	22.5	25.4	45.5	27.0
2	22.9	14.8	16.3	21.3	21.6	18.7	10.9	23.0	22.4	24.7	41.9	30.3
3	22.4	15.8	22.0	22.4	18.9	18.8	11.5	35.6	22.3	24.5	39.9	30.3
4	21.9	15.8	17.3	25.8	16.7	19.0	10.9	46.6	20.5	24.4	45.9	25.9
5	20.2	14.3	18.0	25.9	18.1	19.3	11.1	38.8	20.6	22.7	45.9	24.2
6	16.9	14.8	16.4	29.5	18.8	19.0	11.3	25.4	18.9	21.6	45.2	23.9
7	16.9	15.6	16.7	19.9	20.3	19.3	19.1	24.7	18.5	21.1	42.3	21.2
8	16.1	18.5	17.2	20.3	19.4	17.1	23.6	23.5	17.7	22.4	41.1	22.8
9	17.1	17.2	16.9	25.3	18.6	12.1	23.6	24.8	17.7	24.5	41.0	23.8
10	32.9	17.6	18.8	23.1	17.8	13.1	36.1	25.4	18.8	23.7	42.3	22.6
11	28.6	17.3	22.3	21.3	17.3	13.7	42.5	24.0	21.6	24.1	41.7	24.4
12	17.7	18.3	19.2	22.9	18.3	14.3	37.1	23.8	23.4	25.3	41.5	26.4
13	15.8	18.7	18.9	22.3	18.3	14.3	26.8	23.3	20.0	28.3	44.0	24.5
14	14.8	17.7	18.7	22.4	18.3	14.4	31.0	24.9	19.0	27.0	42.7	23.1
15	15.6	17.5	18.4	24.7	18.6	14.0	34.4	22.5	21.3	27.4	40.1	21.4
16	13.6	17.3	18.8	23.5	18.2	14.0	34.3	21.8	19.9	31.0	39.0	23.8
17	11.6	20.0	18.1	19.4	16.9	13.2	35.3	25.6	19.2	29.5	41.0	27.4
18	11.6	20.4	17.3	18.9	16.1	12.9	33.0	23.3	19.2	30.9	42.7	26.2
19	11.8	19.0	15.8	25.5	16.4	12.9	31.2	21.7	19.9	32.6	39.8	26.9
20	12.4	19.0	17.3	29.9	16.6	12.8	42.6	21.9	20.7	31.6	35.7	23.8
21	10.6	18.8	18.4	33.4	16.9	12.9	46.3	22.6	21.7	31.9	36.9	24.9
22	12.5	18.5	18.4	31.2	15.9	12.7	36.8	22.3	22.1	34.8	35.7	28.7
23	13.6	17.7	19.5	26.6	16.4	12.6	30.5	22.2	22.9	36.4	33.9	23.5
24	13.4	20.7	20.3	27.7	16.3	12.4	42.9	23.8	22.9	36.2	33.8	23.2
25	13.9	20.2	19.3	25.2	16.4	12.1	30.0	24.1	22.7	36.0	32.5	22.9
26	13.3	20.1	18.0	21.2	16.5	12.0	26.7	24.7	23.9	36.5	33.9	22.6
27	12.7	18.7	18.0	17.9	16.7	11.6	41.9	24.1	22.0	36.6	33.0	21.6
28	12.6	17.2	14.9	19.6	17.3	11.9	34.2	22.1	22.2	36.5	31.0	21.5
29	12.4	14.3	22.8	18.0	11.9	28.6	23.0	24.1	36.4	28.6	22.1	
30	15.0	15.5	25.8	18.4	11.2	25.1	23.2	26.6	35.7	25.9	22.5	
31	16.3	27.7		18.4	22.7	24.5	22.9	42.4				22.8
<b>Sum</b>		496.4		721.6		433.0		779.0		922.1		756.2
	511.6		565.2		557.4		887.0		635.2		1,164.4	

**Current Year 1987**

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Period 1968-1987		
			High	Low			Average	Maximum	Minimum
	High	Low	Day	Day			Day	Day	Day
Jan.			10	32.9	21	10.6	16.5	1,015	3,168
Feb.			24	20.7	5	14.3	17.7	985	6,126
Mar.			31	27.7	29	14.3	18.2	1,121	6,437
Apr.			21	33.4	27	17.9	24.1	1,431	7,795
May			1	24.7	22	15.9	18.0	1,106	3,650
June			15	19.3	30	11.2	14.4	859	3,860
July			21	46.3	12	10.9	28.6	1,759	4,054
Aug.			4	46.6	19	21.7	25.1	1,545	8,157
Sept.			30	26.6	8	17.7	21.2	1,260	4,064
Oct.			31	42.4	7	21.1	29.7	1,829	3,376
Nov.			14	45.9	30	25.9	38.8	2,310	6,564
Dec.			12	30.3	7	21.2	24.4	1,500	2,857
				46.6		10.6	23.1	16,720	42,189
									91,498
									10,405
<b>Yearly</b>	<b>Meters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>		
				1.32		0.30	0.65	20,624	52,039
								112,861	12,834

\*\* Period 1968-1987

Ø Mean daily

! And other days

08-4580.00 RIO GRANDE AT PIEDRAS NEGRAS, COAHUILA  
AND EAGLE PASS, TEXAS

**DESCRIPTION:** Cableway, gravity well, water-stage recorder, and resistance-type transmitter located on the left bank at latitude 28° 42' 50", longitude 100° 30' 25", and river mile 497.0 (799.8 km), 0.6 river mile (1.0 km) upstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila and 77.0 river miles (123.8 km) downstream from Amistad Dam. The zero of the gage is 682.91 feet (208.15 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 35 discharge measurements during the year, 29 by the Mexican Section and 6 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: May 1900 through March 1914; August 1914 through April 1916; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June 1922; September, November, and December 1923; and 1924 through 1987. Records prior to 1976 were published under the title "Rio Grande at Eagle Pass, Texas."

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. The transmitter is coupled, via leased telephone circuits, to a receiver located in the office of the Eagle Pass and Piedras Negras Bridge Company, from where the Wheatstone bridge circuit can be balanced to indicate the existing gage height. This system is operated in cooperation with the National Weather Service.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 964,100 second-feet (27,300 m<sup>3</sup>/sec), determined by slope-area calculations, on June 29, 1954 with a gage height of 53.51 feet (16.31 m). Well-authenticated information indicates the occurrence of a flood in June 1865 with an estimated discharge of 1,236,000 second-feet (35,000 m<sup>3</sup>/sec) and a gage height of 56.00 feet (17.07 m) on the present gage, and also that these were the only floods since 1745 with flows greater than 825,000 second-feet (23,400 m<sup>3</sup>/sec). Min. 24.4 second-feet (0.69 m<sup>3</sup>/sec) on June 22, 1953 with a gage height of 0.07 foot (0.02 m).

## Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily: Max. 101,400 (2,870)	July 19, 1975	Min. 173 (4.90)	April 25, 1984
Monthly: Max. 22,000 (622)	Sept. 1974	Min. 323 (9.16)	June 1969
Yearly: Max. 5,190 (147)	1974	Min. 971 (27.5)	1972

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4,700	5,930	4,410	4,480	2,940	8,190	6,320	5,860	6,990	3,280	2,830	1,230
2	3,370	4,840	4,380	3,710	2,920	7,840	6,220	5,860	6,570	3,810	2,870	1,230
3	3,230	4,730	4,340	3,460	2,900	5,930	6,180	5,790	6,290	3,640	2,840	1,210
4	3,210	4,770	4,340	3,440	2,780	6,000	6,070	5,760	6,460	3,210	2,820	1,190
5	3,230	5,230	4,340	3,570	2,830	10,000	6,040	5,790	6,140	3,140	2,780	1,240
6	3,230	5,580	4,340	3,640	2,950	16,700	5,970	5,760	6,180	3,100	2,790	1,150
7	3,260	5,010	4,380	3,600	2,980	12,600	5,690	5,720	6,000	3,920	2,920	1,070
8	3,280	4,980	4,450	2,840	2,790	10,700	3,920	5,720	6,070	3,880	2,950	915
9	3,280	5,010	4,450	2,570	2,540	8,370	3,740	5,760	5,930	3,960	2,900	1,020
10	3,280	4,980	4,520	2,550	2,430	8,480	3,920	5,720	5,760	3,960	2,940	996
11	3,280	4,980	4,730	3,400	2,750	9,290	3,710	5,760	5,990	3,990	2,840	1,110
12	3,290	4,910	4,660	3,530	2,520	9,080	3,710	5,720	5,720	3,920	2,840	1,170
13	3,270	5,010	4,520	3,570	2,310	8,690	3,710	5,690	5,260	3,920	2,900	1,210
14	3,300	4,940	4,770	3,520	2,780	8,160	3,740	5,650	5,120	4,170	2,980	1,200
15	3,640	4,910	4,630	3,600	2,670	7,660	3,810	5,620	5,010	3,920	2,950	1,140
16	3,520	4,840	4,630	2,870	2,320	7,350	3,850	5,620	3,670	3,920	2,890	1,470
17	5,930	4,870	4,800	2,640	2,310	7,700	8,550	5,580	3,080	2,850	1,590	
18	6,140	4,800	4,700	2,740	2,370	7,350	8,890	5,160	3,640	2,990	2,860	1,680
19	6,110	4,840	4,590	2,750	2,500	7,100	7,060	4,870	3,600	2,930	2,720	1,800
20	6,000	4,870	4,700	2,740	2,480	6,890	6,500	4,840	3,400	2,540	1,580	1,770
21	6,040	4,810	4,660	2,930	2,710	6,710	6,360	4,730	3,420	2,510	1,390	1,720
22	6,040	4,800	4,700	3,100	2,470	7,980	6,250	4,730	3,320	2,490	1,370	1,730
23	6,000	4,800	4,700	2,980	2,340	6,670	6,070	4,800	3,230	2,550	1,340	1,740
24	6,000	4,980	4,700	3,060	2,370	6,430	6,000	4,730	3,270	2,570	1,290	1,700
25	5,970	4,910	4,560	3,140	2,350	6,390	6,000	3,780	3,210	2,570	1,310	1,680
26	5,930	4,870	4,590	3,090	2,780	6,290	6,040	3,810	3,410	2,540	1,290	1,660
27	5,900	4,840	4,660	3,060	2,410	6,320	6,140	3,810	3,240	2,450	1,310	1,630
28	6,040	4,800	4,660	3,000	2,300	6,430	6,110	3,740	3,150	2,390	1,270	1,620
29	5,790	4,630	2,990	5,300	6,430	5,970	3,920	3,280	2,380	1,260	1,610	
30	5,970	4,560	2,950	4,870	6,320	5,790	7,880	2,470	3,440	2,450	1,230	1,590
31	6,000	4,590	7,030	3,140	5,930	5,930	7,700	3,440	2,450	1,600	1,600	
<b>Sum</b>	<b>138,830</b>		<b>95,520</b>		<b>240,050</b>		<b>165,880</b>		<b>98,650</b>		<b>43,671</b>	
	144,230		141,690		90,000		172,260		140,250		69,010	

## Current Year 1987

## Period 1968-1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	Day			Average	Maximum	Minimum
Jan.	5.41	3.84	28	6,290	4	3,160	4,660	286,079	116,156
Feb.	5.51	4.13	6	6,530	1	3,710	4,940	275,418	139,901
Mar.	5.45	4.10	17	5,930	1	3,470	4,560	281,022	156,515
Apr.	5.18	3.38	1	5,440	9	2,320	3,190	189,438	138,412
May	8.83	3.25	31	14,300	28	2,100	2,900	178,483	224,522
June	10.96	5.02	6	20,400	3	5,090	7,980	476,028	181,700
July	8.46	3.67	17	13,300	13	2,750	5,540	341,681	196,900
Aug.	6.50	4.13	30	8,300	125	3,500	5,370	329,003	186,962
Sept.	6.07	3.90	1	7,310	28	3,130	4,660	278,206	239,190
Oct.	5.22	3.12	14	5,470	29	1,890	3,180	195,700	216,189
Nov.	3.84	2.62	14	3,040	24	1,150	2,300	136,890	139,160
Dec.	3.38	2.40	16	2,320	8	819	1,410	86,604	110,019
	10.96	2.40		20,400		819	4,240	3,054,552	2,047,626
<b>Yearly</b>	<b>Meters</b>		<b>Cubic Meters per Second</b>		<b>Thousands of Cubic Meters</b>				
	3.34	0.73		579		23.2	120	3,767,750	2,525,718
** Period 1968-1987					* Discharge measurement made on this day				
					! And other days				

## 08-4581.50 RIO ESCONDIDO AT VILLA DE FUENTE, COAHUILA

**DESCRIPTION:** Cableway, gravity well, concrete control weir of 1,750 second-foot (50 m<sup>3</sup>/sec) capacity, and water-stage recorder located on the downstream side of the left abutment of the highway bridge over Rio Escondido on the outskirts of Villa de Fuente, Coahuila, 1.2 river miles (1.9 km) downstream from the cableway at latitude 28°40'05", longitude 100°31'00", about 3 miles (5 km) southwest of Piedras Negras, Coahuila, 3.7 river miles (6.0 km) from the confluence with the Rio Grande, and 6.8 river miles (10.9 km) downstream from the confluence of Rio San Antonio with Rio Escondido. Rio Escondido enters the Rio Grande at river mile 493.2 (793.8 km), 3.1 river miles (5.0 km) downstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila. The zero of the gage is 718.37 feet (218.96 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 20 discharge measurements during the year, 20 by the Mexican Section and 0 by the United States Section of the Commission, and a continuous record of gage heights. Records available: 1922 through 1987. Records from 1922 through September 1932 are considered doubtful.

**REMARKS:** Diversions and drainage returns modify the flow of this spring-fed stream at this station. Backwater from the Rio Grande reached an elevation of 729.92 feet (222.48 m) during the flood of June 1954. Prior to November 1954, the gage well was located at the present cableway site. The weir was destroyed by a flood on September 24, 1964. On November 25, 1969, the concrete control weir was finished and placed in operation.

**EXTREME FLOWS FROM RECORDS\*\*:** Momentary: Max. 24,000 second-feet (680 m<sup>3</sup>/sec) on June 29, 1936 with a gage height of 19.13 feet (5.83 m). Min. frequently no flow.

## Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily: Max.	13,100 (371)	Sept. 24, 1964	Min. 0	Occasionally
Monthly: Max.	827 (23.4)	Sept. 1964	Min. 0.3 (0.01)	September 1965
Yearly: Max.	257 (7.28)	1987	Min. 2.4 (0.07)	1956

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	265	201	186	142	158	186	470	438	334	320	225	186
2	261	204	193	129	158	191	463	378	341	314	222	184
3	261	204	199	128	161	225	452	424	351	307	227	182
4	261	197	196	127	160	201	431	420	353	307	227	180
5	256	208	192	128	158	347	420	417	360	307	226	176
6	256	216	189	129	157	374	413	410	360	307	221	168
7	256	197	180	131	157	360	406	403	367	299	221	167
8	256	193	170	134	151	431	406	392	374	294	215	168
9	254	189	160	136	144	413	399	381	374	292	213	165
10	251	190	164	136	164	438	392	378	371	285	213	163
11	249	190	186	129	240	470	381	371	367	283	213	162
12	243	190	176	123	172	501	378	352	367	280	213	165
13	241	190	170	119	156	512	374	351	360	279	213	165
14	241	186	170	118	152	501	374	350	347	275	213	162
15	241	186	170	118	150	487	399	350	341	272	213	159
16	241	185	170	108	148	480	424	343	341	267	213	163
17	245	184	162	102	146	473	417	332	338	259	213	165
18	241	182	149	99.2	152	480	420	328	332	256	213	165
19	239	182	146	98.9	172	484	438	322	330	259	209	161
20	237	191	146	96.4	153	480	448	312	321	261	207	155
21	237	194	146	112	177	480	448	307	317	256	204	153
22	235	194	146	111	169	554	459	301	317	256	204	153
23	232	195	142	112	166	509	463	295	315	256	204	153
24	230	204	139	150	169	194	466	289	310	253	202	153
25	224	202	143	161	165	487	463	283	308	249	199	153
26	216	199	148	144	165	516	463	279	303	241	196	153
27	213	196	152	150	169	544	466	277	296	230	189	153
28	213	189	150	153	170	477	466	277	292	224	186	153
29	209				146	153	170	473	463	452	227	190
30	197				146	155	173	463	456	367	227	190
31	194				146	178	445	330	349	227	190	150

**Sum** 5,438 3,832.5 13,031 10,909 8,369 5,037  
7,395 5,076 5,080 13,363 10,193 6,294

## Current Year 1987

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	2.17	1.90	1	267	31	194	238	14,666	3,211	18,930
Feb.	2.13	1.84	5	261	116	182	194	10,782	2,416	14,433
Mar.	1.94	1.67	1 3	204	123	138	164	10,063	2,012	11,407
Apr.	2.07	1.44	24	246	119	96.4	128	7,597	2,296	21,950
May	2.69	1.67	11	487	19	142	164	10,075	3,867	25,470
June	3.25	1.84	26	784	1	177	434	25,852	2,993	25,852
July	2.72	2.36	20	501	17	347	431	26,505	2,428	26,505
Aug.	2.92	2.18	29	590	126	277	352	21,636	3,669	30,106
Sept.	2.59	2.20	29	441	28	288	340	20,226	5,251	49,182
Oct.	2.33	2.00	1	326	127	221	270	16,591	4,720	28,620
Nov.	2.00	1.84	1 1	227	28	177	210	12,474	3,672	25,730
Dec.	1.87	1.71	1 1	186	129	150	162	9,934	3,228	22,003
Yearly	3.25	1.44		794		96.4	257	186,461	39,763	186,461
	<b>Meters</b>			<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>			
	0.99	0.44		22.2		2.73	7.28	229,999	49,045	229,999

\*\* Period 1932-1987

\* Discharge measurement made on this day

! And other days

08-4586.00 RETURN FLOW TO THE RIO GRANDE  
FROM THE MAVERICK IRRIGATION DISTRICT  
BELOW EAGLE PASS, TEXAS

**DESCRIPTION:** Part of the water diverted from the Rio Grande into the Maverick Canal is returned to the river through various drains and spillways of the irrigation system located between Eagle Pass, Texas and the El Indio Gaging Station. These return flows are measured at gaging stations consisting of sharp-crested Cipolletti weirs or control structures equipped with continuous water-stage recorders located at Lateral 40 Spill, Canon Diablo, Lateral 50 Spill, Rosita Creek, Lateral 60-K Spill, Sauz Creek, Indio Creek, Gravel Spill, and Cuelvo Creek.

**RECORDS:** Based on the weir discharge table, stable station control rating tables, and a continuous record of gage heights. All storm flow occurring at these stations is deducted from the records and is not shown below. Records available: April 1959 through 1987. Records prior to 1976 were published under the title "Return Flow to the Rio Grande from Maverick Canal, Eagle Pass to San Antonio Crossing."

**EXTREME FLOWS FROM RECORDS:****Average Flow in Second-Feet (Cubic Meters per Second)\*\*\***

Daily: Max.	350 (9.91)	July 5, 1968	Min. 1.4 (0.04)	April 22, 1986
Monthly: Max.	247 (7.00)	July 1968	Min. 4.3 (0.12)	April 1986
Yearly: Max.	180 (5.10)	1971	Min. 14.8 (0.42)	1986

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	21.9	41.7	23.3	18.8	14.4	25.5	34.3	33.0	39.3	39.6	17.0	30.8
2	22.3	37.5	17.6	27.7	14.9	27.4	39.8	20.8	44.4	38.4	18.2	31.3
3	27.0	37.7	17.3	49.8	13.7	35.0	51.2	9.9	38.6	37.4	17.5	32.3
4	27.1	40.4	20.8	39.4	10.9	37.4	52.9	20.3	46.6	15.8	22.5	24.3
5	25.5	45.1	17.9	24.3	23.7	37.3	53.1	19.6	47.5	20.7	25.2	23.8
6	25.5	50.3	18.6	24.4	32.4	36.7	46.3	22.5	55.4	18.6	19.5	21.8
7	26.7	45.2	23.2	26.8	33.6	27.1	44.1	23.2	67.0	18.5	18.7	19.4
8	24.8	43.0	23.5	14.2	35.8	20.4	45.8	23.0	50.9	21.0	17.0	21.6
9	30.0	39.5	19.4	4.5	35.5	17.1	47.4	24.8	33.4	22.6	12.1	22.4
10	31.3	36.4	19.3	13.1	34.8	18.3	44.0	15.1	50.2	22.3	10.6	25.2
11	26.8	28.1	34.7	29.5	35.1	16.0	31.6	18.2	34.1	20.2	15.0	22.1
12	28.9	17.7	30.6	16.3	35.8	15.9	8.4	23.3	40.9	18.6	24.7	21.3
13	32.0	22.9	30.8	10.3	35.3	16.1	31.2	14.0	35.1	21.8	31.6	21.6
14	32.4	29.2	25.4	25.3	29.6	17.4	61.3	9.1	24.0	26.9	28.1	23.9
15	32.7	35.9	18.6	20.2	24.8	18.4	57.7	16.6	22.9	17.8	39.5	28.5
16	23.7	32.5	17.0	15.0	22.6	24.3	43.2	15.9	21.9	12.7	39.0	28.0
17	40.3	32.7	16.4	12.9	24.3	19.5	25.0	10.4	11.1	12.2	34.0	28.6
18	34.6	32.2	10.1	8.2	24.6	19.5	39.0	3.9	18.2	26.8	34.9	30.5
19	27.2	27.6	6.1	7.0	25.7	20.4	53.4	13.0	12.7	27.4	32.1	30.7
20	25.3	24.0	5.3	7.0	19.1	21.2	40.4	12.1	12.0	18.9	33.1	30.6
21	20.9	23.1	6.3	16.0	18.5	22.0	52.2	3.9	8.6	15.2	35.5	31.2
22	14.8	23.2	8.3	27.5	18.1	22.8	67.2	14.1	6.9	14.2	34.1	33.4
23	12.4	23.1	8.4	28.9	17.8	23.8	47.1	16.2	6.4	17.8	21.6	32.3
24	10.5	29.0	3.6	29.4	19.8	24.4	42.9	16.1	6.4	16.8	21.3	32.2
25	11.6	28.0	6.1	29.9	26.0	25.5	43.9	18.7	8.1	15.7	16.8	33.1
26	15.0	23.2	22.7	30.1	24.4	26.6	44.4	28.4	17.6	25.3	14.0	34.7
27	22.8	23.4	36.8	47.5	24.7	27.9	47.6	29.2	24.0	22.4	17.5	37.3
28	32.7	28.5	35.9	32.0	25.1	29.1	40.1	29.5	19.0	21.0	13.7	40.4
29	17.9	33.2	23.0	25.2	30.4	30.2	38.6	17.5	23.3	21.7	39.3	39.3
30	22.0	27.6	21.6	23.7	32.0	33.2	34.3	35.5	23.8	24.8	40.8	42.5
31	34.6	19.1			24.3		34.6	29.8		17.9		
<b>Sum</b>	901.1	680.6	739.0	607.5	671.6	915.9						
	781.2	603.9	774.2	1,333.5	856.2	711.3						

**Current Year 1987****Period 1968-1987**

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	Day			Average	Maximum	Minimum
Jan.			17	40.3	24	10.5	25.2	1,549	6,118
Feb.			6	50.3	12	17.7	32.2	1,787	5,140
Mar.			27	36.8	24	3.6	19.5	1,198	6,781
Apr.			3	49.8	9	4.5	22.7	1,350	7,404
May			18	35.8	4	10.9	25.0	1,536	6,830
June			4	37.4	12	15.9	24.6	1,466	7,173
July			22	67.2	12	8.4	43.0	2,645	7,000
Aug.			29	36.6	18	3.9	19.6	1,205	6,374
Sept.			7	67.0	23	6.4	28.5	1,698	5,396
Oct.			1	39.6	17	12.2	21.7	1,332	5,046
Nov.			15	39.5	10	10.6	23.7	1,411	5,223
Dec.			31	42.5	7	19.4	29.5	1,817	5,529
				67.2		3.6	26.2	18,994	74,014
<b>Yearly</b>	<b>Meters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>		
			1.90		0.10	0.74	23,429	91,295	161,047
									13,217

\*\* Period 1968-1987

0 Mean daily

1 And other days

08-4587.00 RIO GRANDE NEAR EL INDIO, TEXAS  
AND VILLA GUERRERO, COAHUILA

**DESCRIPTION:** Cableway, bubbler gage, concrete control weir, and water-stage recorders (graphic and digital) located on the left bank at latitude 28° 20' 45", longitude 100° 18' 35", and river mile 460.4 (741.0 km), 0.6 river mile (0.9 km) downstream from Cuervo Creek, which marks the lower end of the Maverick County Water Control and Improvement District No. 1, 1.9 river miles (3.1 km) upstream from Tovar Creek, 5 miles (8.0 km) northeast of Villa Guerrero, Coahuila, about 11.5 miles (18.5 km) south of El Indio, Texas, and 35.9 river miles (57.8 km) downstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila. The zero of the gage is 580.00 feet (176.78 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 24 discharge measurements during the year and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: March, April, May, October, November, and December 1952 with some days missing; January through August 20, 1953; September 23, 1953 through June 14, 1954; and May 27, 1955 through 1987 with several days missing prior to September 1955. Records prior to 1976 were published under the title "Rio Grande at San Antonio Crossing near El Indio, Texas."

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 912,000 second-feet (25,800 m³/sec) in June 1954, determined by slope-area computation, with an elevation of 524.31 feet (190.29 m). Min. 54.4 second-feet (1.54 m³/sec) on June 24, 1953 with an elevation of 581.96 feet (177.38 m) at a station 1,700 feet (518 m) upstream from the present site.

Average Flow in Second-Feet (Cubic Meters per Second)\*

Daily: Max. 96,400 (2,730)	July 19, 1975	Min. 327 (9.26)	June 29 & 30, 1972
Monthly: Max. 21,800 (617)	Sept. 1974	Min. 501 (14.2)	June 1969
Yearly: Max. 5,300 (150)	1974	Min. 1,230 (34.8)	1972

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4,550	5,770	4,280	4,190	2,430	9,600	7,890	7,090	7,750	3,890	3,060	1,510
2	4,380	4,950	4,310	3,970	2,430	4,460	7,760	7,090	7,290	3,060	3,150	1,470
3	3,780	4,490	4,280	3,160	2,450	7,180	7,790	6,950	7,060	3,680	3,180	1,460
4	3,370	4,440	4,280	3,110	2,470	6,760	7,570	6,860	7,090	3,650	3,200	1,410
5	3,400	4,700	4,250	3,120	2,400	8,260	7,450	6,840	7,130	3,600	3,270	1,360
6	3,400	5,220	4,240	3,210	3,200	21,300	7,300	6,740	7,090	3,550	3,210	1,350
7	2,990	4,680	4,230	3,180	2,690	13,300	7,190	6,580	6,960	3,910	3,250	1,280
8	2,790	4,480	4,220	2,920	2,920	13,000	5,230	6,450	7,030	4,310	3,410	1,250
9	2,860	4,500	4,200	2,360	2,980	10,100	4,470	6,430	7,090	4,320	3,480	1,240
10	2,860	4,520	4,220	2,180	2,540	9,870	4,600	6,410	6,830	4,380	3,420	1,240
11	2,910	4,550	4,260	2,480	5,910	10,200	4,430	6,350	6,900	4,410	3,410	1,220
12	2,960	4,400	4,230	2,920	3,110	4,220	6,250	6,900	4,440	3,440	1,220	
13	3,050	4,690	4,080	2,950	2,770	9,970	4,170	6,190	6,580	4,460	3,470	1,220
14	3,080	4,510	4,550	2,900	2,700	9,360	4,140	6,170	6,330	4,460	3,530	1,210
15	3,270	4,410	4,290	2,900	3,360	9,010	4,480	6,140	6,150	4,490	3,530	1,310
16	3,370	4,350	4,310	2,730	2,680	8,320	4,320	6,090	5,910	4,320	3,550	1,330
17	4,610	4,480	4,220	2,160	2,530	8,910	6,720	6,110	4,340	3,860	3,360	1,350
18	5,730	4,310	4,370	2,000	2,530	8,570	7,500	5,890	4,080	3,270	3,300	1,350
19	6,070	4,310	4,060	2,020	2,770	8,320	7,770	5,980	3,980	3,270	3,260	1,480
20	6,140	4,340	4,330	2,030	2,780	8,120	7,700	5,410	4,210	3,070	2,550	1,950
21	6,050	4,290	4,190	2,130	2,910	7,980	7,360	5,300	4,170	2,710	1,730	1,880
22	6,140	4,260	4,250	2,400	2,750	9,200	7,430	5,200	3,960	2,690	1,700	1,880
23	5,980	4,250	4,190	2,300	2,600	8,210	7,220	5,220	3,830	2,700	1,670	1,810
24	6,030	4,400	4,180	2,260	2,560	7,600	7,150	5,290	3,870	2,830	1,610	1,810
25	5,990	4,450	4,170	2,540	2,560	7,720	7,030	4,460	3,810	2,820	1,580	1,820
26	5,980	4,380	4,120	2,510	2,520	7,510	7,030	3,600	3,780	2,790	1,600	1,850
27	5,890	4,390	4,220	2,500	3,110	7,220	3,590	3,940	2,730	1,570	1,830	
28	5,910	4,330	4,170	2,500	2,570	7,710	7,430	3,610	3,650	2,730	1,540	1,840
29	5,690	4,150	2,430	3,110	7,960	7,160	4,410	3,730	2,730	1,540	1,810	
30	5,750	4,090	2,440	6,090	8,000	7,030	6,870	4,080	2,730	1,530	1,820	
31	5,700	4,110	5,680	6,960	6,960	8,340	2,730					1,840

Sum	126,850	80,510	278,410	183,410	109,290	47,400
140,680	131,150	94,110	201,730	165,520	82,100	

## Current Year 1987 | Period 1968-1987

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	8.12	7.09	20	6,270	7	2,710	4,540	279,035	127,301	279,035
Feb.	8.11	7.52	1	5,850	121	3,600	4,530	251,603	116,692	444,879
Mar.	8.01	7.40	14	5,130	30	3,370	4,230	260,132	164,574	423,055
Apr.	7.92	6.67	1	4,870	18	1,780	2,680	159,689	118,498	361,567
May	8.79	6.86	11	10,900	1	2,180	3,040	186,664	240,509	600,198
June	10.05	7.92	4	24,400	1	5,030	9,280	552,218	203,825	552,218
July	8.94	7.38	17	12,400	14	3,370	6,510	400,125	211,262	788,688
Aug.	8.52	7.44	30	8,720	126	3,530	5,920	363,788	206,948	824,033
Sept.	8.43	7.45	1	7,980	28	3,650	5,520	328,304	254,304	1,296,059
Oct.	7.95	6.96	7	5,130	23	2,390	3,530	216,773	231,385	83,327
Nov.	7.38	6.47	16	3,650	30	1,510	2,740	162,843	153,492	552,893
Dec.	6.84	6.36	19	2,100	14	1,200	1,530	94,016	121,754	276,555
Yearly	10.05	6.36		24,400		1,200	4,500	3,255,190	2,210,544	3,835,752
	Meters			Cubic Meters per Second				Thousands of Cubic Meters		
	3.06	1.94		691		34.0	127	4,015,212	2,726,662	4,731,323
										1,105,710

\*\* Period 1968-1987

\* Discharge measurement made on this day

! And other days

08-4590.00 RIO GRANDE AT LAREDO, TEXAS  
AND NUEVO LAREDO, TAMAULIPAS

**DESCRIPTION:** Cableway, bubbler gage, and water-stage recorder located on the right bank at Laredo, Texas at latitude 27° 29' 45", longitude 99° 29' 25", and river mile 359.8 (579.0 km), immediately downstream from the Laredo, Texas sewage plant and 1.1 river mile (1.8 km) downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas. The zero of the gage is 345.28 feet (105.24 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 24 discharge measurements during the year, and a continuous record of gage heights. Computations by shifting control methods. Records available: May 1900 through 1913; May, June, and October 1914; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June, November, and December 1922; and 1923 through 1987. Gage height records are available for January, February, and March 1914.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. This station was established in January 1955 to replace the station 1.7 miles (2.7 km) upstream which was destroyed by the June-July 1954 flood. Prior to July 11, 1968 the recorder was located 0.2 river mile (0.3 km) upstream, where the cableway is still located, and the zero of the gage was 347.90 feet (106.04 m) above mean sea level, U. S. C. & G. S. datum.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 716,900 second-feet (20,300 m<sup>3</sup>/sec) on June 30, 1954, determined by slope-area calculations, with a gage height of 61.35 feet (18.70 m). Much well-authenticated information established the occurrence of a greater flood in June 1865 with a gage height of 62.5 feet (19.05 m) on the same gage and discharge of approximately 950,000 second-feet (27,000 m<sup>3</sup>/sec), and also that these were the only floods since 1745 with flows greater than 600,000 second-feet (17,000 m<sup>3</sup>/sec). Min. no flow several days in June and July 1953 and on July 24, 1956.

Average Flow in Second-Feet (Cubic Meters per Second)\*

Daily: Max.	115,000 (3,270)	June 30, 1971	Min.	247 (7.00)	July 2, 1972
Monthly: Max.	20,400 (575)	Sept. 1974	Min.	498 (14.1)	June 1969
Yearly: Max.	5,370 (152)	1974	Min.	1,350 (38.3)	1972

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4,990	5,580	4,530	4,060	2,600	5,570	7,560	6,610	9,340	3,870	2,520	1,560
2	4,980	5,570	4,460	4,420	2,620	9,450	7,400	6,600	8,260	3,740	2,620	1,540
3	4,510	4,880 *	4,430	3,690	2,680	8,640	7,270	6,580	7,730	3,610	3,040	1,520
4	3,570	4,430	4,420	3,140	2,690	8,110	7,230	6,550	7,170	4,230	3,090	1,490
5	3,500	4,770	4,420	3,190	3,640 *	6,910	7,130	6,450	7,120	3,870	3,110	1,490
6	3,500	5,040	4,400	3,220	3,140	9,810	7,010	6,350	7,180	3,480	3,150	1,440
7	3,530	5,380	4,390	3,210	3,380	19,500	6,890	6,300	7,030	3,440	3,140	1,460
8	3,530	4,800	4,410	3,220	2,900	14,400	6,840	6,150	6,920	3,640	3,130	1,380
9	3,530 *	4,740	4,410	3,120	2,990	13,100	5,280	6,070	6,950	4,330	3,330	1,330
10	3,520	4,730	4,390	2,460	2,950	10,800	4,500	6,070	6,890	4,320	3,360	1,210
11	3,520	4,730	4,510	2,260	3,130	11,700	4,530	6,000	6,670	4,360	3,230	1,250
12	3,450	4,760	4,740	2,270	5,850	10,800	4,550	5,900	6,730	4,380	3,160	1,260
13	3,390	4,650	4,700	2,930	3,280	10,500	4,340	5,810	6,710	4,360	3,230	1,290
14	3,420	4,920	4,450	2,970	2,770	10,200	4,190	5,750	6,330	4,350	3,310	1,350
15	3,420	4,790	4,850	2,960	9,480	5,280	5,800	6,050	4,480 *	3,450	1,420	
16	3,540	4,780	4,660	2,910	3,150	9,020	4,360	5,830	5,950 *	4,520	3,510	1,390
17	3,710	4,760	4,690	2,880	2,700	8,400	4,320	5,940	5,010	4,380	3,470	1,380
18	4,580	4,660	4,750	2,300	2,430	8,920	7,000	5,990	4,180	4,150	3,390	1,580
19	5,830	4,550	4,700	2,100	2,500	8,550	8,410	6,040	3,950	3,360	3,350	1,880
20	6,000	4,370	4,410	2,130	2,600	8,260	7,920	5,680	3,990	3,330	3,320	1,950
21	6,020 *	4,500	4,490	2,190	2,580	8,070	7,640	5,590	3,880	3,220	2,970	2,030
22	5,970	4,570	4,460	2,460	2,600	7,940	7,390	5,600	3,970	2,850	1,950	1,980
23	5,940	4,500	4,470	2,650	2,590	9,290	7,410	5,530	3,760	2,780	1,750	1,960
24	5,890	4,540	4,370	2,710	2,640	8,180	7,310	5,530	3,590	2,740	1,700	1,970
25	5,890	4,810	4,310	2,520	3,170	7,520	7,250	5,550	3,530	2,830	1,650	1,960
26	5,890	4,840	4,230	2,700	2,420	7,540	7,180	4,740	3,540	2,800	1,630	1,930
27	5,890	4,630	4,200	2,730	2,270	7,380	7,460	3,690	3,530	2,760	1,600	1,920
28	5,800	4,610	4,290	2,680	2,700	7,430	7,440	3,650	3,780	2,680	1,580	1,920
29	5,790	4,170	2,680	2,230	7,560	7,320	3,760	3,500	2,510	1,580	1,890	
30	5,630	4,030	2,630	2,520	7,600	7,050	5,560	3,420	2,520	1,570	1,880	
31	5,570	4,140	5,610	2,180	2,150	6,880	6,180	5,680	2,580	2,580	1,860	

Sum 133,890      85,390      280,630      179,950      110,500      50,470  
144,250      137,880      91,850      202,340      166,620      81,890

**Current Year 1987**

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	6.17	4.28	120	6,020	13	3,390	4,650	286,116	128,563	286,116
Feb.	6.06	4.71	7	5,760	4	3,860	4,780	265,567	148,241	450,602
Mar.	5.68	4.53	1	5,200	31	3,530	4,450	273,481	165,549	395,686
Apr.	5.31	3.13	1	4,620	19	1,960	2,850	169,369	151,888	369,202
May	7.46	3.49	12	8,410	30	2,040	2,960	182,182	258,887	662,839
June	13.64	5.51	7	21,500	1	4,560	9,350	556,621	238,149	695,494
July	8.91	4.41	18	11,500	14	3,530	6,530	401,335	217,643	838,520
Aug.	8.18	4.55	31	9,670	28	3,570	5,800	356,925	214,705	794,314
Sept.	8.17	4.41	1	9,630	30	3,320	5,550	330,486	261,935	1,216,757
Oct.	5.88	3.62	16	5,400	31	2,320	3,560	219,173	266,074	956,960
Nov.	4.47	2.65	16	3,560	28	1,530	2,730	162,426	157,445	586,280
Dec.	3.27	2.25	21	2,120	10	1,160	1,630	100,106	125,590	307,569
	13.64	2.25		21,500		1,160	4,560	3,303,787	2,334,670	3,891,074
Yearly	Meters			Cubic Meters per Second				Thousands of Cubic Meters		
	4.16	0.69		609		32.9	129	4,075,155	2,879,769	4,799,562
										1,209,723

\*\* 1968-1987

\* Discharge measurement made on this day

! And other days

## 08-4597.00 RIO SALADO NEAR LAS TORTILLAS, TAMAULIPAS

**DESCRIPTION:** Cableway, control weir with notch opening of 2,500 second-foot (72 m<sup>3</sup>/sec) capacity, gravity well, and water-stage recorder located on the right bank at latitude 26°50'10", longitude 99°33'50", 2.0 river miles (3 km) downstream from the confluence of Rio Sabinas with Rio Salado, 6 miles (10 km) southeast of the town of Las Tortillas, Tamaulipas, and 24.8 river miles (39.9 km) from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 299.5 (482.0 km), 24.7 river miles (39.8 km) upstream from Falcon Dam. The zero of the gage is 325.72 feet (99.28 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 24 discharge measurements during the year, 22 by the Mexican Section and 2 by the United States Section of the Commission, a stable rating curve up to 2,500 second-feet (72 m<sup>3</sup>/sec), and a continuous record of gage heights. Computations by shifting control methods for flows greater than 2,500 second-feet (72 m<sup>3</sup>/sec). Records available: September 9, 1953 through 1987. Records are also available for a station at old Cd. Guerrero, 21.7 miles (35 km) downstream, from 1900 through 1913 and 1923 through September 8, 1953.

**REMARKS:** Reservoirs and irrigation diversions modify the flow at this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 65,000 second-feet (1,840 m<sup>3</sup>/sec) on September 16, 1971 with a gage height of 40.39 feet (12.31 m). Min. frequently no flow. The maximum discharge was measured at the highway bridge 13.0 river miles (20.9 km) downstream from the station. Extreme flow data for the Rio Salado at Cd. Guerrero prior to September 8, 1953 may be found in previous bulletins.

## Average Flow in Second-Feet (Cubic Meters per Second)\*

Daily:	Max. 62,900 (1,780)	Sept. 16, 1971	Min. 0	Frequently
Monthly:	Max. 13,600 (384)	Sept. 1971	Min. 0	Frequently
Yearly:	Max. 3,310 (93.6)	1971	Min. 56.8 (1.61)	1956

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	40.3	2.1	88.3	* 61.8	26.8	* 58.3	* 73.5	61.8	1,130	117	* 45.2	* 56.5
2	38.8	* 1.4	* 71.4	53.7	26.8	67.1	56.9	48.4	879	498	* 46.6	* 55.1
3	38.8	1.4	48.0	54.4	24.7	38.4	44.8	* 41.7	1,120	* 199	* 43.4	* 48.0
4	38.5	1.1	41.0	40.3	675	* 148	44.5	46.3	371	128	* 44.8	33.9
5	33.9	445	31.1	35.3	1,600	98.2	37.4	36.7	138	104	* 41.7	27.9
6	22.6	833	19.4	42.0	466	122	41.3	29.3	137	85.5	38.5	* 24.0
7	8.5	417	11.7	57.2	194	562	35.0	19.4	108	86.9	31.1	* 30.4
8	3.5	216	4.2	63.6	135	1,430	36.0	10.9	96.8	78.4	37.8	* 23.7
9	2.5	165	3.2	60.0	206	805	38.8	4.2	86.9	68.2	37.1	12.4
10	2.1	98.9	2.8	55.8	175	381	30.7	3.2	81.9	59.3	38.8	4.9
11	1.4	68.5	9.9	53.3	155	279	24.7	2.5	74.9	55.1	55.4	* 2.5
12	1.4	55.1	30.4	49.1	107	151	19.4	4.8	60.0	55.4	50.9	1.4
13	2.1	43.8	48.0	51.6	96.4	116	5.3	1.1	56.5	48.7	* 45.9	1.1
14	2.1	32.1	43.4	* 47.0	80.9	111	18.4	0.7	55.1	47.3	40.3	0.7
15	2.1	24.4	44.8	39.6	* 64.6	84.0	22.2	0.4	* 49.8	* 40.6	39.6	0.4
16	* 2.5	* 22.6	* 47.3	39.6	53.3	78.0	51.2	0.4	42.7	31.1	43.8	0.4
17	3.5	16.2	46.3	39.6	48.7	87.6	117	0	41.0	31.1	47.3	8.5
18	3.5	5.7	41.0	39.6	49.4	81.6	43.1	0	33.2	33.2	44.1	6.7
19	3.5	3.2	41.7	37.4	53.0	72.7	46.6	0	78.4	35.3	45.6	7.4
20	2.5	24.7	37.4	78.8	64.6	35.7	0	78.0	27.5	44.5	51.6	16.2
21	14.1	2.5	21.5	35.3	145	58.3	21.5	0	80.5	31.4	44.8	21.2
22	13.4	2.5	28.6	35.3	146	53.0	8.5	0	137	58.3	44.8	22.2
23	20.8	2.1	49.4	33.2	82.6	43.4	3.5	0	73.8	80.2	49.1	* 25.4
24	14.5	2.1	48.7	33.2	182	41.7	2.1	0	49.4	41.7	52.3	27.2
25	8.1	2.5	53.7	31.1	357	36.0	8.5	0	49.1	45.9	51.6	34.6
26	3.9	43.4	48.4	31.1	480	39.6	47.0	0	53.0	60.7	48.4	36.0
27	14.1	78.0	53.0	31.1	237	240	60.0	0	43.4	54.7	53.3	41.0
28	6.5	99.6	48.0	29.0	141	371	183	73.5	50.1	53.0	56.5	51.2
29	3.9	53.3	29.0	93.9	192	403	32.8	143	47.0	55.4	49.1	49.4
30	3.2	69.6	26.8	72.4	113	202	127	144	44.1	56.5	49.4	39.9
31	2.1	* 66.7	57.9	102	1,470							
<b>Sum</b>	2,717.7	1,273.4	6,333.1	2,612.1		2,393.2			5,591.5	1,375.1	759.3	
	370.2	1,242.3	6,311.2	1,863.6								

## Current Year 1987

## Period 1954-1987

Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	.52	.10	1	41.7	31	1.4	12.0	735	9,952	59,812
Feb.	.43	.07	6	1,160	!	1.1	97.1	5,390	8,270	66,880
Mar.	.92	.20	29	117	10	2.8	39.9	2,465	4,935	29,690
Apr.	.75	.43	1	80.9	30	26.8	42.4	2,525	12,694	202,979
May	3.35	.39	5	2,680	4	22.6	203	12,515	29,006	362,793
June	2.92	.46	8	1,860	25	31.1	211	12,560	31,737	246,821
July	1.87	.10	!	597	!	1.4	60.0	3,695	30,234	441,541
Aug.	3.02	0	31	1,990	!	0	84.4	5,180	22,390	210,031
Sept.	2.69	.39	3	1,520	21	24.7	186	11,091	81,826	807,616
Oct.	2.07	.39	2	770	20	20.5	77.3	4,748	53,369	550,739
Nov.	.82	.39	8	97.1	8	22.6	45.9	2,727	27,493	338,000
Dec.	.66	.03	!	56.5	!	0.4	24.4	1,506	17,709	176,100
	3.35	0		2,680		0	90.4	65,137	329,615	2,400,544
	Meters			Cubic Meters per Second					Thousands of Cubic Meters	
	1.02	0		75.90		0	2.56	80,344	406,576	2,961,050
										50,859

\*\* Period September 1953-1987

\* Discharge measurement made on this day

! And other days

08-4613.00 RIO GRANDE BELOW FALCON DAM NEAR FALCON, TEXAS  
AND NUEVA CO. GUERRERO, TAMAULIPAS

**DESCRIPTION:** The discharges reported below represent water measured as it leaves Falcon Reservoir through turbine penstocks, bypass valves, spillway gates, and leakage. Falcon Dam, astride the Rio Grande, is located at latitude 26°33'35", longitude 99°10'00", and river mile 274.8 (442.3 km); about 7 miles (11.3 km) southwest of Falcon, Texas and 86.1 river miles (138.6 km) downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas. A gravity well and water-stage recorder located 2.5 river miles (4.1 km) downstream and a cableway located one mile (1.6 km) farther downstream are used to measure the flow of this station at times when spillway gates are in operation.

**RECORDS:** Based on daily Simplex meter records of releases through the six turbines, established rating curves for the four hollow-jet bypass valves, estimates of gate leakage, and measurements of flow at the cable during spillgate operations. During 1987 there were 5 discharge measurements made by the United States Section of the Commission. Records available: 1958 through 1987. Records are also available from December 17, 1952 through 1957 for a station at Chapeno, 2.6 miles (4.1 km) downstream, where discharges included arroyo inflow below Falcon Dam, which inflow is eliminated from the records reported below.

**REMARKS:** Computation of flow was made jointly by the United States and Mexican Sections of the Commission from a consolidation of the basic data gathered by each Section incident to the international operation of Falcon Reservoir.

**EXTREMES FLOWS FROM RECORDS:\*\*** Momentary: Max. 82,600 second-feet (2,340 m<sup>3</sup>/sec) on September 18, 1971. Min. 1.5 second-feet (0.04 m<sup>3</sup>/sec) on March 24 and 25, 1957 (at Chapeno gaging station).

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max. 76,400 (2,160)	Sept. 18, 1971	Min. 1.5 (0.04)	March 24 & 25, 1957
Monthly:	Max. 32,500 (920)	Oct. 1958	Min. 23.5 (0.67)	November 1973
Yearly:	Max. 6,930 (196)	1958	Min. 1,580 (44.7)	1970

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	118	218	426	1,280	10,000	9,170	7,320	812	18.0	513	3,060	278
2	85.0	411	414	1,560	11,000	6,100	7,340	829	18.0	18.0	3,020	633
3	18.0	537	420	2,550	11,300	6,010	7,560	896	18.0	18.0	2,550	721
4	18.0	715	522	3,020	10,900	5,230	7,670	1,140	430	18.0	1,980	849
5	332	713	927	3,110	10,400	5,250	7,080	1,420	801	995	1,720	1,090
6	319	1,030	874	1,820	7,850	5,190	6,480	1,400	818	2,820	1,510	1,100
7	323	1,020	696	1,310	4,140	2,850	5,700	1,830	847	4,030	1,510	1,130
8	164	1,010	698	1,470	4,280	555	5,420	2,150	209	3,570	1,250	1,030
9	118	1,020	702	1,280	4,630	187	5,500	2,160	239	3,030	18.0	831
10	118	1,010	807	925	4,580	68.0	4,160	1,870	7,970	2,920	611	713
11	193	1,020	877	1,580	4,280	118	3,500	1,600	8160	2,950	611	712
12	268	823	1,870	3,900	119	3,600	1,850	8,080	2,990	624	743	911
13	268	1,010	320	2,280	3,880	119	4,500	2,960	7,900	2,980	320	1,010
14	118	1,530	176	2,470	4,320	119	3,930	3,210	7,920	3,030	315	803
15	118	1,520	329	2,320	4,170	119	2,180	3,480	7,950	3,030	602	1,070
16	118	1,720	221	1,760	4,130	119	2,520	3,500	6,000	3,050	18.0	707
17	268	2,290	214	2,660	4,310	119	2,840	3,450	4,060	3,010	504	514
18	268	2,540	525	3,450	4,840	119	3,290	3,350	4,020	2,960	1,020	632
19	268	1,790	561	3,640	6,010	119	3,240	3,040	4,020	3,120	824	968
20	268	1,200	811	3,820	5,970	119	3,110	3,730	4,080	3,000	768	1,070
21	195	1,170	1,110	4,200	5,800	263	2,950	3,420	4,050	3,050	1,330	396
22	18.0	1,180	1,210	4,640	6,460	405	2,670	3,940	3,970	3,040	1,330	313
23	68.0	1,180	1,220	5,310	7,480	920	2,570	4,040	4,000	3,020	1,320	117
24	118	1,070	1,270	4,990	7,650	2,420	2,070	3,910	2,470	3,040	619	117
25	118	801	1,320	5,260	7,640	4,860	1,440	3,370	512	3,010	612	757
26	118	429	827	5,790	8,200	7,010	1,940	2,540	18.0	3,040	1,040	1,080
27	118	414	819	6,350	9,630	6,430	726	2,540	18.0	3,010	989	1,200
28	118	420	919	7,610	10,800	6,080	18.0	2,740	18.0	3,010	940	1,430
29	168	1,030	8,990	11,200	6,590	18.0	2,850	518	2,960	931	1,580	2,330
30	218	1,030	9,790	9,960	7,100	428	2,650	968	2,990	471	1,760	2,330
31	218	1,020	10,400	11,300	123	417	824					
<b>Sum</b>	29,978	107,105	220,110	83,877.0	112,187.0	77,501	90,100.0	81,312.0	32,417.0	27,525		
	5,233.0	23,118										

**Current Year 1987**

**Period #1954-1987**

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.			5	332	1 3	18.0	169	10,379	210,593	462,369
Feb.			18	2,540	1	218	1,070	50,460	153,319	367,384
Mar.			25	1,320	14	176	746	45,854	130,681	374,142
Apr.			30	9,790	10	925	3,570	212,440	286,127	608,707
May			3	11,300	13	3,890	7,100	436,582	350,857	715,233
June			1	9,170	10	68.0	2,800	166,368	252,710	672,976
July			4	7,670	128	18.0	3,620	222,520	148,451	391,071
Aug.			23	4,040	1	812	2,500	153,721	218,145	1,478,678
Sept.			11	8,160	1 1	18.0	3,000	178,711	170,008	1,080,871
Oct.			7	4,030	1 2	18.0	2,620	161,280	219,112	1,997,000
Nov.			1	3,060	1 9	18.0	1,080	64,298	109,369	1,128,000
Dec.			31	2,330	123	117	888	54,595	105,222	465,000
				11,300		18.0	2,440	1,766,208	2,354,594	5,016,800
										1,143,806
<b>Yearly</b>	<b>Meters</b>			<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>		
				320	0.51	69.1	2,178,582	2,904,345	6,188,122	1,410,862

\*\* Period 1954-1987      \* Discharge measurement made on this day

Ø Mean daily

\* Values prior to 1958 are Chapeno, Texas less arroyos inflow

! And other days

## 08-4620.0 RIO ALAMO AT CD. MIER, TAMAULIPAS

**DESCRIPTION:** Cableway, reinforced concrete weir of 177 second-foot (5 m<sup>3</sup>/sec) capacity, gravity well, and water-stage recorder located on the right bank at a point called "El Paso del Cantaro," latitude 26°27'00", longitude 99°09'05", about 0.5 mile (1 km) north of Cd. Mier, Tamaulipas, and 5.0 river miles (8 km) from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 262.4 (422.3 km), 12.4 river miles (20.0 km) downstream from Falcon Dam. The weir is located about 300 feet (91 m) downstream from the recorder. The zero of the gage is at mean sea level, U.S.C.& G.S. datum.

**RECORDS:** Based on 9 discharge measurements made at high flows during the year, 7 by the Mexican Section and 2 by the United States Section of the Commission, the weir discharge table at low flows, and a continuous record of gage heights. High flow computations by shifting control methods. Records available: July 1923 through 1987.

**REMARKS:** Small reservoirs and irrigation diversions modify the flow of this spring-fed stream at this station. On June 11, 1952, the zero of the gage was raised 1.31 feet (0.40 m) to make it coincide with the weir crest elevation. Prior to January 1, 1969, the zero of the gage was 188.35 feet (57.41 m) above mean sea level, U. S. C. & G. S. datum.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 144,800 second-feet (4,100 m<sup>3</sup>/sec) on September 11, 1948 with a gage height of 33.56 feet (10.23 m). Min. periods of no flow have occurred at times during all years of record except 1934, 1935, 1968, 1972, 1974, 1976, 1977, 1979, and 1981.

## Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max. 87,230 (2,470)	Sept. 11, 1948	Min. 0	Frequently
Monthly:	Max. 7,310 (207)	Sept. 1967	Min. 0	Frequently
Yearly:	Max. 837 (23.7)	1967	Min. 16.4 (0.47)	1929

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	21.5	15.5	24.4	17.3	0	0	6.4	0	6,850	1.8	0	0
2	17.7	15.9	23.3	17.3	0	0	3.2	0	1,510 *	1.4	0	0
3	13.4	15.9	23.3	17.3	0	0	1.4	0	1,410 *	0.7	0	0
4	10.9	15.5	23.3	14.1	1.1	0	0.4	0	547	0.7	0	0
5	10.2	282	22.6	10.9	226	0	0	0	224	0	0	0
6	9.2	448	21.5	13.4	86.9	53.3	0	0	* 114	0	0	0
7	10.6	71.3	21.5	15.9	25.8	106	0	0	* 72.0	0	0	0
8	10.6	34.6	21.5	14.8	9.9	512	0	0	49.1	0	1.1	0
9	10.2	25.1	21.5	14.5	4.6	128	0	0	35.3	0	5.3	0
10	9.2	23.0	21.5	14.5	2.5	52.6	0	0	24.7	0	0.7	0
11	9.2	19.8	24.0	14.1	1.1	52.3	0	0	18.7	0	0	0
12	9.5	14.8	25.4	13.1	0.7	25.4	0	0	18.1	0	0	0
13	16.6	24.4	21.5	12.7	0.4	9.9	0	0	10.6	0	0	0
14	12.0	20.1	23.3	11.7	0	10.6	0	0	8.8	0	0	0
15	12.4	20.8	23.3	9.2	*	4.9	0	0	7.1	0	0	0
16	13.1	19.8	23.3	*	8.1	0	2.8	0	0	6.0	0	0
17	13.1	18.7	23.3	*	8.1	0	1.4	0	0	6.0	0	0
18	13.1	19.1	22.2	6.7	0	0.7	0	0	5.7	0	0	0
19	13.1	21.5	20.5	7.1	0	0	0	0	4.9	0	1.4	0
20	13.1	22.2	21.2	7.1	0	0	0	0	4.6	0	0.7	0
21	15.9	19.8	21.5	7.4	0	0	0	0	* 25.4	0	0	0
22	18.4	19.1	21.2	8.1	0	0	0	0	54.7	0	0	0
23	17.7	20.1	19.8	8.5	0	0	0	0	48.0	15.5	0	0
24	15.5	20.1	*	18.7	9.2	0	0	0	17.7	8.8	0	0
25	14.1	21.5	18.7	9.2	0	0	21.5	0	10.2	7.9	0	0
26	13.4	26.1	18.7	7.1	0	0	106	0	7.1	2.8	0	0
27	12.7	27.9	19.8	3.9	0	18.4	129	0	5.7	1.4	0	0
28	12.0	25.1	19.8	1.4	0	46.6	17.3	0	4.6	1.1	0	0
29	12.0	20.1	18.7	0	0	27.2	6.7	0	4.2	0.7	0	0
30	12.4	17.7	0	0	14.1	2.1	190	0	2.5	0	0	0
31	13.8	17.3	0	0	0	0.7	6,220 *	0	0	0	0	0
<b>Sum</b>	<b>1,319.9</b>	<b>302.7</b>	<b>359.0</b>	<b>1,066.2</b>	<b>294.7</b>	<b>6,410.0</b>	<b>39.8</b>	<b>0</b>	<b>400.9</b>	<b>667.2</b>	<b>11,202.7</b>	<b>9.2</b>

## Current Year 1987

## Period 1924-1987

Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	188.71	188.52	1	24.7	!	9.2	13.1	795	3,113	34,920
Feb.	190.88	188.58	5	950	5	13.1	47.3	2,619	3,162	53,474
Mar.	188.71	188.65	12	26.1	!	17.3	21.5	1,324	2,333	19,830
Apr.	188.65	188.35	!	17.3	!	0	10.2	600	5,754	36,210
May	190.29	188.32	5	494	!	0	11.7	712	11,733	137,000
June	193.86	188.35	8	699	!	0	35.4	585	7,207	62,246
July	190.16	188.39	26	431	!	0	9.5	0	0	0
Aug.	196.46	188.35	31	9,960	0	0	207	12,705	14,572	205,700
Sept.	196.10	188.39	1	8,790	30	1.8	374	22,214	36,612	434,387
Oct.	188.65	188.35	23	20.1	4	0	1.4	79.4	16,910	193,700
Nov.	188.68	188.35	8	21.5	!	0	0.4	17.8	3,942	25,165
Dec.	188.35	188.35	!	0	!	0	0	0	3,232	15,982
Yearly	196.46	188.32		9,960		0	61.1	43,766	120,856	605,678
	<b>Meters</b>		<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>				
	59.88	57.40	282	0	1.73	53,985	149,039	747,096	14,686	

\*\* Period 1924-1987

\* Discharge measurement made on this day

! And other days

## 08-4642.00 RIO SAN JUAN AT CAMARGO, TAMAULIPAS

**DESCRIPTION:** Cableway, gravity well, and water-stage recorder located on the left bank opposite Camargo, Tamaulipas at latitude 26° 18'40", longitude 98°50'15", 3.1 river miles (5 km) from the confluence with the Rio Grande, and 9.3 river miles (15 km) downstream from Marte R. Gomez Dam. This stream enters the Rio Grande at river mile 238.7 (384.1 km); 3.7 river miles (6.0 km) upstream from the Rio Grande gaging station at Rio Grande City, 36.1 river miles (58.1 km) downstream from Falcon Dam. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 56 discharge measurements during the year, 55 by the Mexican Section and 1 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Discharge prorated between measurements during times of extremely low flow. Records available: January 1954 through 1987.

**REMARKS:** Except for storm inflow, diversions, and drainage returns below Marte R. Gomez Dam, the flow at this station is controlled by spills from Marte R. Gomez Reservoir and leakage through the dam. Backwater from the Rio Grande frequently reaches this station. Prior to July 1, 1968 the zero of the gage was 130.45 feet (39.76 m) above mean sea level, U. S. C. & G. S. datum.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 115,000 second-feet (3,270 m³/sec) on September 25, 1967 with a gage height of 42.03 feet (12.81 m). Min. 0.4 second-foot (0.01 m³/sec) several days in May and June 1979 and March 1982.

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 115,000 (3,250)	Sept. 25, 1967	Min. 0.4 (0.01)	Various days in May & June 1979 and March 1982
Monthly:	Max. 31,600 (894)	Sept. 1967	Min. 1.1 (0.03)	May 1979
Yearly:	Max. 3,990 (113)	1967	Min. 10.9 (0.31)	1980

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	12.0	10.6	12.0	11.7	11.7	24.7	10.9	7.4	44.1	3,390	770	225	
2	12.7	10.2	12.4	12.0	11.7	26.1	10.9	6.4	97.1	4,200	720	230	
3	13.1	9.5	13.1	12.0	11.7	25.1	10.9	5.7	706	4,130	710	236	
4	13.8	9.2	13.4	12.0	15.3	24.4	10.9	4.9	996	3,600	699	242 *	
5	14.1	9.2	*	13.8	12.0	159	23.3	10.6	3.9	1,150	3,130	671	253
6	*	14.8	8.6	13.4	12.0	21.9	22.6	10.6	3.2	1,200	2,750	639	264
7	14.8	8.8	12.7	12.0	20.5	21.5	10.6	3.2	1,260	2,440	657	275 *	
8	14.8	8.8	12.0	12.0	19.1	20.5	10.2	3.2	1,270	2,220	671	269	
9	15.2	8.5	11.7	12.0	17.7	19.8	10.2	3.2	1,240	2,010	689	223 *	
10	15.2	8.5	11.3	12.0	16.2	18.7	10.2	3.2	879	1,830	533	229	
11	15.2	8.5	10.6	12.0	14.8	17.7	10.2	3.2	378	1,670	378	235 *	
12	15.2	8.1	9.9	11.7	13.4	17.0	9.9	3.2	35.3	1,510	345	226	
13	15.2	8.1	9.5	11.7	12.4	15.9	9.9	3.2	35.3	1,360	312	216	
14	15.5	7.8	9.2	11.7	10.9	15.2	9.9	3.2	35.3	1,210	314	206 *	
15	15.5	7.8	8.5	11.7	9.5	14.1	9.5	3.2	35.3	1,100	316	163	
16	15.5	7.8	7.8	11.7	8.1	13.1	*	9.5	3.2	28.3	1,010	318	120 *
17	15.5	7.4	7.4	11.7	6.7	12.4	9.5	3.2	*	7.1	939	344	114
18	15.5	*	7.4	7.1	11.7	5.3	11.3	9.2	3.2	7.1	876	325	107
19	15.5	*	7.8	6.4	11.7	3.9	11.3	9.2	*	3.2	7.1	833	306
20	15.9	8.1	6.7	11.7	5.7	11.3	9.2	3.2	7.1	851	287	93.9	
21	15.9	8.8	7.1	11.7	7.1	11.3	8.8	3.2	7.1	1,130	268	87.6	
22	*	15.9	9.2	11.7	8.5	11.3	8.8	3.2	7.1	992	249	80.9	
23	15.5	9.5	8.1	11.7	10.2	11.3	8.8	3.2	417	915	230	74.5	
24	14.8	9.9	8.5	11.7	12.0	11.3	8.8	3.2	2,180	915	237	67.8	
25	14.5	10.2	8.8	11.7	13.4	11.3	8.5	3.2	3,220	*	243	61.4	
26	13.8	10.9	9.2	11.7	14.8	10.9	8.5	3.2	3,110	915	292	54.7	
27	13.4	11.3	9.5	11.7	16.6	10.9	8.5	3.2	2,970	915	341	48.4	
28	12.7	11.7	9.9	11.7	18.4	10.9	8.1	3.2	2,830	*	301	41.7	
29	12.4		10.2	11.7	19.8	10.9	*	8.1	3.2	2,690	886	260	35.3
30	11.7		10.9	11.7	21.2	10.9	8.1	374	2,590	*	219	33.9	
31	11.3		11.3		23.0		8.1	188		816		32.1	
<b>Sum</b>		252.4		354.0		477.0		667.1		51,234		4,626.2	
	446.9		309.8		610.5		295.1		29,439.3		12,644		

## Current Year 1987

## Period 1954-1987

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	!	15.9	31	11.3	14.5	887	9,753	95,871	88.4	
Feb.	28	11.7	!	7.4	9.2	501	5,799	64,323	72.9	
Mar.	5	13.8	19	6.4	9.9	615	2,916	21,513	70.0	
Apr.	!	12.0	!	11.7	11.7	700	2,630	36,876	153	
May	5	353	19	3.9	19.8	1,210	3,671	28,709	73.0	
June	2	26.1	!	10.9	15.9	946	15,708	334,608	74.6	
July	!	10.9	!	8.1	9.5	586	27,316	341,479	143	
Aug.	30	706	!	3.2	21.5	1,323	20,203	273,904	77.0	
Sept.	25	3,300	!	7.1	982	58,404	109,826	1,878,406	62.3	
Oct.	2	4,310	31	795	1,650	101,594	101,222	901,500	193	
Nov.	1	770	30	219	420	21,997	27,829	230,100	125	
Dec.	7	275	31	32.1	149	9,176	16,928	154,765	163	
Yearly				4,310	3.2	276	200,939	343,579	2,891,093	8,060
	Meters			Cubic Meters per Second			Thousands of Cubic Meters			
				122	0.09	7.82	247,857	423,804	3,566,125	9,941

\* Discharge measurement made on this day

! And other days

08-4645.00 CONTRIBUTIONS TO THE RIO GRANDE FROM  
THE LOWER RIO SAN JUAN IRRIGATION DISTRICT  
FALCON DAM TO RIO GRANDE CITY

**DESCRIPTION:** The Lower Rio San Juan Irrigation District in Mexico lies along the Rio Grande between Cd. Miguel Aleman and Rio Bravo, Tamaulipas and is irrigated with water impounded by Marte R. Gomez Dam situated on the Rio San Juan 12.4 river miles (20 km) upstream from the confluence with the Rio Grande. The Rio San Juan enters the Rio Grande at river mile 238.7 (384.1 km). Drain water from this irrigation district enters the Rio Grande between Falcon Dam and the Rio Grande City Gaging Station through the Rio San Juan channel, Rancherias Drain, and Los Fresnos Drain; and between this station and Anzalduas Dam through Puericitos, Los Indios, Huizache, and Morillo Drains. Only the portion of water reaching the Rio Grande via drains located upstream from the Rio Grande City Gaging Station is shown below. Drain water reaching the Rio Grande through the Rio San Juan channel is included in the Rio San Juan tabulation.

**RECORDS:** Water entering the Rio Grande through the Rio San Juan Channel, composed of spills and leakage from Marte R. Gomez Dam, storm inflow and drainage below the dam, is measured at the Rio San Juan Gaging Station at Camargo, Tamaulipas, 3.1 river miles (5 km) upstream from the confluence with the Rio Grande. The discharge through Rancherias Drain was determined by prorating between 25 current meter measurements made during the year. There were no drainage flows through Los Fresnos Drain in 1987. All storm water measured at these two drains was deducted and is not included in the tabulation below. Records available: 1953 through 1987. Records prior to 1976 include Rio San Juan flow.

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.1	1.8	1.4	1.4	8.5	9.2	7.8	6.0	5.7	2.8	3.2	1.4
2	2.1	1.8	1.4	1.4	9.2	9.2	7.8	6.0	5.7	2.8	3.2	1.4
3	2.1	1.8	1.4	1.4	9.5	9.2	7.4	6.0	5.7	2.8	3.2	1.4
4	2.1	*	1.8	1.4	10.2	9.5	7.4	5.7	5.3	2.8	3.2	1.1
5	1.8	1.8	*	1.4	10.9	9.5	7.4	5.7	5.3	2.8	3.2	1.1
6	*	1.8	1.8	1.4	11.7	9.5	7.4	5.7	4.9	3.2	2.8	1.1
7	1.8	1.8	1.4	1.4	11.3	9.9	7.4	5.7	4.6	3.2	2.8	1.1
8	1.8	1.8	1.4	1.4	10.9	9.9	7.4	5.7	4.6	3.2	2.8	1.1
9	1.8	1.8	1.4	1.4	10.6	9.9	7.4	5.7	4.2	3.2	2.5	*
10	1.8	1.8	1.4	1.4	10.6	9.9	7.8	6.0	3.9	3.2	2.5	1.1
11	1.8	1.8	1.4	1.4	10.2	10.2	7.8	6.0	3.9	3.2	2.5	1.1
12	1.8	1.8	1.4	1.8	9.9	10.2	7.8	6.0	3.5	3.2	2.5	1.1
13	1.8	1.8	1.8	1.8	9.5	10.2	7.8	6.0	3.5	3.5	2.1	1.4
14	1.8	1.8	1.8	1.8	9.2	10.6	7.8	6.0	3.2	3.5	2.1	1.4
15	2.1	1.8	1.8	1.8	8.8	10.6	7.8	6.0	2.8	3.5	2.1	1.4
16	2.1	1.8	1.8	1.8	8.8	10.6	*	7.8	6.4	2.8	3.5	*
17	2.1	1.8	1.8	1.8	8.5	10.9	7.8	6.4	*	2.5	3.5	1.8
18	2.1	*	1.8	1.8	8.1	*	10.9	7.4	6.4	2.5	3.5	1.8
19	2.1	1.8	1.8	1.8	7.8	10.6	7.4	*	6.4	2.5	3.5	1.8
20	2.1	1.8	1.8	1.8	7.8	10.6	7.1	6.4	2.5	3.5	1.8	1.8
21	2.1	1.8	*	1.8	8.1	10.2	7.1	6.4	2.5	3.5	1.8	1.8
22	*	2.1	1.8	2.5	8.1	9.9	7.1	6.4	2.5	3.5	1.8	1.8
23	2.1	1.8	1.8	3.2	8.1	9.9	6.7	6.0	2.5	3.5	1.4	1.8
24	2.1	1.8	1.8	3.9	8.1	9.5	6.7	6.0	2.5	3.5	1.4	1.8
25	2.1	1.8	1.8	4.2	8.5	9.2	6.7	6.0	2.8	3.5	1.4	1.8
26	2.1	1.4	1.8	4.9	8.5	9.2	6.4	6.0	2.8	3.5	1.4	1.8
27	2.1	1.4	1.4	5.7	8.5	8.8	6.4	6.0	2.8	3.2	1.4	2.1
28	2.1	1.4	1.4	6.4	8.8	8.5	6.0	6.0	2.8	3.2	1.4	2.1
29	1.8	1.4	1.4	7.1	8.8	8.5	*	6.0	6.0	3.2	1.4	2.1
30	1.8	1.4	1.4	7.8	8.8	8.1	6.0	6.0	2.8	3.2	1.4	2.1
31	1.8	1.4	1.4	8.8	8.8	6.0	5.7	5.7	3.2	3.2	1.4	2.1
<b>Sum</b>		49.2		79.1		292.9		186.7		101.4		47.0
		61.2		49.0		285.1		222.8		106.4		64.5

**Current Year 1987**

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.				2.1	!	1.8	2.1	121	195	898
Feb.				1.8	!	1.4	1.8	95.7	311	938
Mar.				1.8	!	1.4	1.4	96.5	245	771
Apr.			30	7.8	!	1.4	2.5	156	304	718
May		6		11.7	!	7.8	9.2	566	616	1,454
June	!			10.9	30	8.1	9.9	581	553	1,257
July	!			7.8	!	6.0	7.1	441	278	561
Aug.	!			6.4	!	5.7	6.0	369	215	443
Sept.	!			5.7	!	2.5	3.5	211	219	697
Oct.	!			3.5	!	2.8	3.2	202	196	797
Nov.	!			3.2	!	1.4	2.1	127	176	641
Dec.	!			2.1	!	1.1	1.4	92.4	155	495
				11.7		1.1	4.2	3,059	3,463	6,786
<b>Yearly</b>	<b>Meters</b>			<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>		
				0.33		0.03	0.12	3,773	4,269	8,370

\* Mean daily

\* Discharge measurement made on this day

! And other days

08-4646.00 DIVERSIONS FROM THE RIO GRANDE  
UNITED STATES SIDE, FALCON DAM TO RIO GRANDE CITY

Beginning June 1971, the Texas Water Rights Commission, now the Texas Water Commission, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1987, 5,013 irrigable acres (2,029 ha) and several towns and rural homes were allotted Rio Grande water in the river reach between Falcon Dam and the Rio Grande City gaging station. Such irrigable area was 0.7% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1987 in this river reach was 9,363 acre-feet (11,549,000 m<sup>3</sup>), or 1.0% of the total water diverted from the Rio Grande below Falcon Dam. All records of diversions in this river reach, which were determined by means of flow meters, were furnished by the Rio Grande Watermaster. More than one crop per year is often grown on parts of this land.

Records prior to 1976 were published under the title "Diversions from the Rio Grande, United States Side-Falcon Dam to Fort Ringgold."

## EXTREME FLOWS FROM RECORDS:

	Average Flow in Second-Feet (Cubic Meters per Second)					
Daily:	Max.	124 (3.51)	April 6-9, 1984	Min.	0	Occasionally
Monthly:	Max.	55.7 (1.58)	April 1984	Min.	2.2 (0.06)	March 1957
Yearly:	Max.	20.3 (0.57)	1960	Min.	6.9 (0.20)	1968

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.2	10.5	4.4	39.9	23.5	1.4	6.1	10.7	22.1	36.2	22.8	15.5
2	3.2	18.5	4.9	39.1	29.7	1.4	15.4	10.7	10.0	36.2	25.9	15.5
3	3.2	18.0	8.3	45.5	27.2	1.4	14.3	14.3	8.5	38.7	12.4	15.5
4	3.2	15.6	8.3	40.0	24.6	1.4	16.6	18.0	10.4	31.0	12.6	14.8
5	4.1	11.6	11.0	14.9	16.4	1.4	14.6	18.6	15.7	32.1	13.9	16.6
6	3.7	9.3	14.6	12.4	13.1	3.9	20.0	17.9	10.1	33.3	12.0	10.1
7	9.5	9.0	14.9	5.2	12.2	4.1	20.3	19.4	15.3	34.6	9.9	12.2
8	13.9	5.6	9.6	5.2	12.2	4.3	19.5	21.2	15.7	34.6	5.5	12.5
9	8.7	14.0	14.8	5.2	14.6	3.9	21.1	14.2	16.8	32.4	5.6	9.9
10	6.9	21.8	13.9	5.2	11.7	3.9	21.1	12.2	13.8	34.6	5.2	13.9
11	3.1	23.9	11.1	8.2	12.1	3.9	21.8	12.9	12.6	32.2	5.2	8.5
12	3.3	19.9	8.3	5.7	15.4	3.9	22.0	17.0	18.3	35.8	5.2	9.5
13	3.0	28.4	6.6	6.0	15.4	6.6	16.8	19.5	14.3	26.3	7.9	6.5
14	3.0	24.1	8.4	8.5	19.8	4.3	19.2	21.5	11.4	27.6	11.3	6.5
15	3.0	14.9	5.4	18.1	46.9	4.6	33.1	23.1	16.2	27.6	8.4	6.5
16	3.0	18.6	7.6	18.4	29.6	4.3	22.4	14.0	19.6	27.1	12.8	6.5
17	3.0	22.9	9.8	16.9	22.8	4.3	22.3	13.0	18.5	29.6	14.5	6.1
18	3.0	20.6	11.6	18.6	26.1	4.4	22.8	13.6	19.0	26.3	13.7	6.1
19	3.2	14.2	8.3	6.1	19.0	4.4	9.3	12.4	17.9	31.7	11.2	8.4
20	3.0	8.3	10.1	8.9	15.6	7.3	9.3	14.2	12.7	24.0	10.4	5.8
21	3.0	11.0	17.0	8.5	16.0	4.1	9.3	13.6	8.2	20.4	12.0	5.8
22	3.0	5.3	15.1	8.0	15.1	4.5	8.6	18.5	7.8	20.1	3.9	5.8
23	3.0	8.8	22.1	7.5	19.8	4.0	8.1	14.3	7.8	23.9	8.0	5.8
24	6.6	10.8	24.6	7.4	14.9	4.0	7.0	16.4	8.4	21.5	7.2	5.8
25	6.6	10.5	24.5	14.0	15.9	4.2	4.6	16.4	11.1	10.5	5.5	5.7
26	7.8	5.7	19.8	10.5	15.5	4.2	0.9	14.9	13.3	18.2	3.2	5.7
27	13.1	2.8	17.4	12.2	19.2	4.2	0.9	13.7	7.2	18.9	3.2	3.4
28	12.5	7.3	12.5	7.1	20.6	1.3	0.1	13.7	4.9	26.4	4.6	3.4
29	12.9	3.3	3.3	5.4	23.1	2.0	0.1	10.6	2.6	27.8	1.7	3.1
30	20.8	4.3	26.7	21.8	0.7	0.1	5.7	1.3	24.1	0.3	3.1	
31	10.2	0		13.7		0.1	5.7		18.2		3.1	
Sum		391.9	435.3	108.3		461.9		861.9		257.6		
	189.7	352.5	603.5	407.8		374.5		276.0				

## Current Year 1987

## Period 1957-1987

Month	Average Rainfall		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	Inches**	1957-1987	Day	High	Low		Average	Maximum	Minimum
Jan.	1.00	1.10	30	20.8	13	6.1	376	673	1,482
Feb.	2.20	1.19	13	28.4	27	2.8	777	794	1,782
Mar.	.49	.54	24	24.6	31	0	699	1,079	1,845
Apr.	2.09	1.49	3	45.5	1	5.2	863	1,232	3,314
May	4.08	2.72	15	46.9	10	11.7	1,197	984	2,624
June	4.18	2.74	20	7.3	30	0.7	215	910	2,610
July	2.34	1.44	15	33.1	128	0.1	809	718	1,620
Aug.	2.46	2.22	15	23.1	130	5.7	916	707	1,458
Sept.	2.19	4.40	1	22.1	30	1.3	1,710	571	1,230
Oct.	.37	2.16	3	38.7	25	10.5	27.8	571	178
Nov.	1.60	1.11	2	25.9	30	0.3	9.2	567	1,710
Dec.	.60	.88	5	16.6	129	3.1	8.3	511	1,580
	23.60	21.99		46.9		0	12.9	9,363	9,566
								14,754	4,989
Yearly	Millimeters			Cubic Meters per Second			Thousands of Cubic Meters		
	599	559	1.33	0	0.37		11,549	11,799	18,199
							0 Mean daily	! And other days	6,154

\*\* United States side - average of several stations in the reach

08-4647.00 RIO GRANDE AT RIO GRANDE CITY, TEXAS  
NEAR CAMARGO, TAMAULIPAS

**DESCRIPTION:** Cableway, bubbler gage, gravity well, water-stage recorders (graphic and digital), and digital transmitter located on the left bank at Fort Ringgold, latitude 26° 22' 00", longitude 98° 48' 10", and river mile 235.0 (378.1 km); about 1 mile (1.6 km) downstream from Rio Grande City, Texas, and 3.7 river miles (6.0 km) downstream from Rio San Juan. The zero of the gage is 100.00 feet (30.48 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 24 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: January 1955 through 1987. Records prior to 1976 were published under the title "Rio Grande at Fort Ringgold, Rio Grande City, Texas." Records composed of the addition of discharges of the Rio Grande at Roma, Texas and the Rio San Juan at Santa Rosalia, Tamaulipas are available for May, June, and October 1914; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June 1922; September 1923; and 1924 through 1931. Records are also available for the station "Rio Grande near Rio Grande City," 3.0 miles (4.8 km) downstream, for 1932 through 1954.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. Except for tributary inflows and intervening diversions below Falcon Dam, flow at this station is controlled largely by releases from Falcon Reservoir, 39.9 river miles (64.1 km) upstream. The transmitter relays gage height data via radio to the Mercedes Office of the Commission, where it is recorded automatically, and to the Anzalduas Dam control room for visual readout.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 220,000 second-feet (6,230 m<sup>3</sup>/sec) on September 22 and 23, 1967 with a gage height of 61.40 feet (18.71 m). Min. no flow occurred several days in June and July 1953.

Average Flow in Second-Feet (Cubic Meters per Second)\*

Daily: Max. 207,000 (5,860)	Sept. 23, 1967	Min. 12.7 (0.36)	March 5, 1985
Monthly: Max. 49,600 (1,400)	Oct. 1958	Min. 235 (6.66)	March 1957
Yearly: Max. 9,140 (259)	1958	Min. 1,750 (49.6)	1970

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	510	141	523	1,180	9,600	11,300	7,130	420	5,080	4,020	3,370	849
2	413	134 *	500	1,320	9,970	8,470	7,470	613	3,640	4,820	3,320	451
3	346	169	502	1,530	10,500	7,140	7,750	784	1,900	4,190	3,470	665
4	324	350	486	2,340	10,900	5,800	7,990	867 *	1,990	3,600	2,750	868
5	298 *	519	516	2,860	11,500	5,510	8,230	952	1,590	3,130	2,290	979
6	241	964	815	3,100	10,400	5,710	8,220	1,080	1,950	3,380	2,090	1,180
7	318	1,210	861	1,810	6,510	5,710	6,880	1,260	1,930	5,080	1,870	1,230
8	467	1,170	746	1,290	3,890	3,610	6,150	1,460	1,880	6,140	1,910	1,200
9	477	1,160	731	1,450	4,070	1,550	5,640	1,790	1,940	5,080	1,960	1,190
10	398	1,200	734	1,300	4,170	1,460	5,210	1,940	2,810	4,360	1,050	1,050
11	285	1,260	846	933	4,030	871	4,580	2,010	8,240	4,080	821	943
12	258	1,290	922	1,520	3,810	470	3,980	1,940	8,010	3,920	953	935
13	268	1,260	890 *	1,730	3,490	341	4,010	1,910	7,870	3,840	960	980
14	356	1,340	686	2,030	3,480	314	4,530	2,510	7,810	3,730 *	902	1,080
15	366	1,750	367	2,220	3,760 *	627 *	4,050	2,910	7,850	3,690	673	1,330
16	286	1,940	398	2,030	3,860	402	2,500	3,220	7,830	3,560	941 *	996
17	226	2,120 *	441	1,680	3,830	313	2,770	3,380 *	4,090	3,530	772	848
18	193	2,550	363	2,640	3,940	206	3,020	3,450	3,760	3,460	593	817
19	259	2,800	542	3,180	4,810	320	3,400	3,480	4,000	3,430	1,240	755
20	302 *	2,280	693	3,280 *	6,150	318	3,300	3,280	4,020	3,340	1,080	1,080
21	303	1,610	845	3,570	6,090	311	3,250	3,490	3,850	3,750	970	1,150
22	309	1,430	1,170	4,050	5,960	316	3,070	3,490	4,070	3,540	1,360	763
23	265	1,430	1,270	4,310	7,250	389	2,870	3,720	4,210	3,510	1,420	583
24	176	1,360	1,310	4,670	8,190	700	2,610	3,870	5,900	3,660	1,390	455
25	107	1,250	1,310	4,440	8,570	1,550	2,320	3,970	5,560	3,610	918	354
26	98.4	1,100	1,370	4,780	8,400	2,920	1,950	3,290	4,060	3,590	827	731
27	121	743	1,030	5,240	9,050	4,610	2,160	2,490	3,310	3,510	1,150	1,120
28	122	542	975	6,100	9,770	5,620	1,570	2,500	2,950	3,440	1,160	1,060
29	115	1,030	7,940	10,600	6,060	718	2,650	2,750	3,440	1,010	1,220	
30	108	1,100	9,390	10,400	6,570	451	3,220	2,730	3,420	998	1,300	
31	114	1,240			10,400	328	7,310		3,380		1,420	
<b>Sum</b>	35,072	93,913		89,588		79,256		119,230		29,582		
	8,430.4	25,212		217,350		128,107		127,130		44,218		

**Current Year 1987**

**Period #1954-1987**

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	Day			Average	Maximum	Minimum
Jan.	25.41	24.78	1	594	26	89.8	272	216,272	127,991
Feb.	27.35	25.13	9	3,140	2	134	1,250	167,304	376,607
Mar.	26.57	25.15	26	1,550	15	299	813	50,007	134,899
Apr.	30.83	25.66	30	9,720	11	607	3,130	186,274	284,342
May	32.23	27.31	5	12,000	13	2,430	7,010	431,107	363,472
June	31.67	25.07	1	11,700	14	283	2,990	177,695	282,093
July	29.72	24.98	5	8,280	31	304	4,130	254,096	658,255
Aug.	31.12	24.99	31	10,200	1	309	2,560	157,202	78,662
Sept.	30.28	26.51	11	8,580	9	1,330	4,240	252,159	22,300
Oct.	29.81	27.48	8	7,510	20	2,470	3,850	236,489	24,066,000
Nov.	28.60	25.49	3	4,450	18	491	1,470	87,705	145,261
Dec.	27.03	25.30	31	1,810	25	325	954	58,675	123,351
	32.23	24.78		12,000		89.8	2,730	1,977,694	2,803,751
								6,619,700	1,269,259
<b>Yearly</b>	<b>Meters</b>		<b>Cubic Meters per Second</b>		<b>Thousands of Cubic Meters</b>				
	9.82	7.55	340	3.79	77.3	2,439,446	3,458,371	8,165,268	1,565,606

\*\* Period 1955-1987  
\* Discharge measurement made on this day  
# 1954 values are Rio Grande City less arroyo inflow

08-4683.00 CONTRIBUTIONS TO THE RIO GRANDE FROM THE LOWER RIO SAN JUAN IRRIGATION DISTRICT  
RIO GRANDE CITY TO ANZALDUAS DAM

**DESCRIPTION:** The Lower Rio San Juan Irrigation District in Mexico lies along the Rio Grande between Cd. Miguel Aleman and Rio Bravo, Tamaulipas and is irrigated with water impounded by Marte R. Gomez Dam situated on the Rio San Juan 12.4 river miles (20 km) upstream from the confluence with the Rio Grande. The Rio San Juan enters the Rio Grande at river mile 238.7 (384.1 km). Drain water from this irrigation district enters the Rio Grande between Falcon Dam and the Rio Grande City Gaging Station through the Rio San Juan channel, Rancherias Drain, and Los Fresnos Drain; and between this station and Anzalduas Dam through Puertecitos, Los Indios, Huizache, and Morillo Drains. Only the portion of drain water from this irrigation district reaching the Rio Grande via drains located downstream from Rio Grande City Gaging Station is shown below.

**RECORDS:** Drain water reaching the Rio Grande through Morillo Drain was determined by hourly staff gage readings and the weir discharge tables, and through Puertecitos and Los Indios Drains by prorating between frequent current meter measurements. All storm water measured at these drains was deducted and is not included in the tabulation below. In 1987, 49% of the drain water from this irrigation district reaching the Rio Grande between the Rio Grande City Gaging Station and Anzalduas Dam was contributed by Morillo Drain. Records available: 1953 through 1987.

**REMARKS:** Since July 9, 1969, some water has been diverted from Morillo Drain directly to the gulf via the Morillo Drain Diversion Canal to reduce the salinity of Rio Grande waters. In 1987, 44,146 acre-feet (54,453,000 m<sup>3</sup>) were diverted.

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	48.0	8.8	8.5	8.5	57.2	177	78.0	24.4	21.2	85.8	50.5	9.2
2	44.1	8.5	8.5	8.5	77.3	156	87.9	24.4	21.2	82.6	52.3	9.2
3	33.5	7.8	8.5	8.5	172	128	91.5	24.0	20.8	79.8	54.0	8.8
4	36.7	7.4	8.5	8.5	195	99.6	98.5	23.7	20.1	76.7	55.8	8.8
5	59.3	7.4	8.5	8.5	160	101	104	23.7	19.4	73.5	55.8	8.5
6	39.6	7.8	8.5	8.5	188	98.2	100	23.3	18.4	70.3	55.4	8.5
7	31.4	7.8	8.5	8.5	143	94.3	96.4	23.3	17.7	67.5	27.5	8.1
8	26.8	7.8	8.5	8.5	108	91.1	65.0	23.3	17.0	63.9	13.4	8.1
9	25.4	7.8	8.5	8.5	95.0	87.6	137	23.3	16.2	61.1	13.4	7.8
10	32.1	8.1	8.5	8.5	59.0	84.4	96.4	23.3	15.5	58.3	13.1	7.4
11	35.3	8.1	8.5	8.5	105	81.6	115	23.3	14.5	54.7	13.1	7.4
12	34.6	8.1	8.5	8.5	57.2	78.0	94.6	23.3	13.8	51.9	12.7	7.1
13	61.4	8.5	8.5	8.5	47.7	74.9	81.9	23.0	13.1	48.7	21.5	7.1
14	70.3	8.5	8.5	8.5	44.1	71.7	62.5	23.0	12.4	45.6	13.8	6.7
15	71.7	8.5	8.5	8.5	39.6	67.8	63.2	23.0	15.2	42.4	12.4	6.7
16	40.6	8.5	8.5	8.5	34.3	64.6	64.3	23.0	102	45.2	12.0	6.4
17	59.3	8.8	8.5	9.5	30.7	61.1	75.6	23.0	97.1	48.7	12.0	6.7
18	47.3	8.8	8.5	8.5	35.0	57.9	148	23.0	92.5	51.6	11.7	7.4
19	14.5	8.8	8.5	9.2	31.8	53.0	147	23.0	88.6	55.1	11.7	7.8
20	13.1	8.8	8.5	10.2	37.1	51.9	146	22.6	84.4	58.3	11.3	6.1
21	14.1	8.8	8.5	8.5	42.0	54.7	145	22.6	79.8	68.2	11.3	8.5
22	13.8	8.8	8.5	12.4	47.0	52.3	144	22.2	75.6	78.0	10.9	9.2
23	13.4	8.8	8.5	15.9	52.3	49.1	105	22.6	71.7	87.9	10.9	9.5
24	12.7	8.8	8.5	148	57.6	47.0	42.0	22.2	67.1	80.9	10.6	9.9
25	12.4	8.8	8.5	116	62.5	45.9	52.6	22.2	62.9	73.8	10.6	11.7
26	11.7	8.5	8.5	89.3	64.6	47.7	79.8	21.9	67.8	66.4	10.2	10.9
27	11.3	8.5	8.5	60.7	69.9	73.1	127	21.9	73.1	59.3	10.2	11.3
28	10.6	8.5	8.5	81.9	79.8	48.7	71.7	21.5	78.4	52.3	9.9	11.7
29	10.6	8.5	8.5	71.3	95.0	70.6	31.4	21.5	83.3	45.2	9.5	12.4
30	9.9	8.5	8.5	70.3	119	83.0	26.1	21.2	88.3	46.6	9.5	12.7
31	9.5	8.5	8.5	197			24.7	21.5		46.7		13.1
<b>Sum</b>	234.1	847.7	2,351.8		708.2		1,929.0			276.7		
	955.0	263.5	2,603.7		2,802.1		1,511.1			627.0		

Current Year 1987

Period 1954-1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Low		Average	Maximum	Minimum		
Jan.			15	71.7	31	9.5	30.7	1,895	2,277	6,812	466
Feb.			!	8.8	7.4	8.5	465	3,050	7,059	465	
Mar.			!	8.5	!	8.5	521	2,121	5,291	521	
Apr.			24	148	!	8.5	28.3	1,680	3,230	6,111	899
May			31	197	17	30.7	84.0	5,162	7,604	30,179	1,557
June			1	177	25	45.9	78.4	4,666	8,522	85,952	2,027
July			18	148	31	24.7	90.4	5,317	4,601	48,782	899
Aug.			!	24.4	30	21.2	23.0	1,404	2,358	13,292	661
Sept.			16	102	14	12.4	50.5	2,997	2,285	11,273	612
Oct.			23	87.9	15	42.4	62.2	3,826	2,767	9,831	541
Nov.			!	55.8	!	9.5	20.8	1,244	1,978	10,461	430
Dec.			31	13.1	16	6.4	8.8	549	2,402	34,043	466
				197		6.4	41.2	29,726	43,195	179,482	13,462
<b>Yearly</b>	<b>Meters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>				
				5.59		0.18	1.17	36,664	53,290	- 221,389	16,608

0 Mean daily

! And other days

08-4684.00 DIVERSIONS FROM THE RIO GRANDE  
UNITED STATES SIDE, RIO GRANDE CITY TO ANZALDUAS DAM

Beginning June 1971, the Texas Water Rights Commission, now the Texas Water Commission, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1987, 179,657 irrigable acres (72,707 ha) and several towns and rural homes were allotted Rio Grande water in the river reach between the gaging station at Rio Grande City and Anzalduas Dam. Such irrigable area was 25.0% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1987 in this river reach was 220,096 acre-feet (271,484,000 m<sup>3</sup>), or 24.6% of the total water diverted from the Rio Grande below Falcon Dam. About 85% of the water diverted in this river reach was determined by the International Boundary and Water Commission through records of discharge obtained by means of flow meters and by deflection meters developed by the Commission. The records for the rest of these diversions were furnished by the Rio Grande Watermaster and were determined from records of discharge obtained by means of flow meters. More than one crop per year is often grown on parts of this land.

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 1,220 (34.6)	June 21, 1960	Min. 0	Occasionally
Monthly:	Max. 1,010 (28.6)	June 1960	Min. 10.3 (0.29)	March 1957
Yearly:	Max. 457 (12.9)	1982	Min. 188 (5.32)	1966

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	26.1	110	91.2	562	608	126	540	182	389	193	228	309
2	31.3	186	120	537	559	78.1	574	153	332	195	522	322
3	35.4	241	193	505	510	50.0	415	261	387	208	581	384
4	31.9	221	276	332	627	68.1	348	331	386	179	619	351
5	94.9	201	236	266	593	115	385	366	265	243	618	219
6	44.5	188	273	271	492	45.3	542	372	117	245	556	257
7	98.2	157	170	193	370	36.1	606	331	221	279	354	355
8	158	199	194	142	221	30.9	625	222	336	361	345	404
9	149	326	368	129	157	118	610	262	420	356	148	443
10	99.1	306	339	176	118	36.6	568	476	498	237	234	363
11	77.4	358	210	111	202	25.7	507	481	487	271	178	285
12	213	383	115	138	220	69.3	447	511	425	481	200	254
13	166	318	148	329	192	101	622	544	366	461	180	174
14	148	252	89.0	408	191	23.0	589	418	530	495	186	310
15	102	258	115	514	217	43.0	628	280	614	458	128	368
16	103	442	159	491	141	53.4	586	279	671	420	232	368
17	29.0	476	166	415	154	87.7	486	626	641	439	309	245
18	41.3	455	266	313	246	107	365	704	578	319	309	203
19	29.3	404	346	241	296	123	381	679	425	393	309	137
20	38.7	240	359	544	321	22.0	501	682	347	396	344	161
21	27.4	196	296	669	321	49.7	576	649	551	537	256	187
22	51.8	231	362	609	335	127	486	497	536	492	261	250
23	26.8	300	420	590	228	114	465	472	588	297	423	216
24	69.0	296	388	534	226	192	321	585	652	249	429	54.3
25	49.0	204	381	416	352	193	242	604	489	267	388	9.5
26	80.7	127	391	382	421	152	219	627	353	427	145	9.5
27	47.5	111	341	527	537	158	238	596	326	493	204	120
28	104	32.6	154	534	476	151	175	486	104	499	123	190
29	156		156	516	376	409	172	403	83.5	465	202	279
30	153		358	621	296	476	175	433	145	403	163	294
31	110		369	232			235	404		256		158

Sum	7,218.6	12,015	3,380.9	13,916	11,014	7,679.3
2,591.3	7,849.2	10,235	13,629	12,262.5	9,174	

Current Year 1987

Period 1957-1987

Month	Average Rainfall Inches**		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	1987	1957-1987	Day	Day			Average	Maximum	Minimum
Jan.	1.69	1.35	12	213	1	26.1	83.6	5,140	12,188
Feb.	1.47	1.22	17	476	28	32.6	258	14,318	38,599
Mar.	.38	.65	23	420	14	89.0	253	15,569	20,731
Apr.	.76	1.40	21	669	11	111	401	23,831	41,200
May	3.20	2.62	4	627	10	118	330	20,301	23,355
June	5.22	2.75	30	476	20	22.0	113	6,706	22,731
July	2.24	1.49	15	628	29	172	440	27,033	22,817
Aug.	1.45	2.13	18	704	2	153	449	27,602	22,741
Sept.	3.17	3.70	16	671	29	83.5	409	24,322	36,280
Oct.	.80	2.49	21	537	4	179	355	21,846	15,625
Nov.	.99	.99	4	619	28	123	306	18,196	35,000
Dec.	.72	.97	9	443	125	9.5	248	15,232	14,714
	22.09	21.76		704		9.5	304	220,096	223,752
Yearly	Millimeters			Cubic Meters per Second			Thousands of Cubic Meters		
	561	553		19.9		0.27	8.61	271,484	275,994
** United States side - average of several stations in the reach					Mean daily				
					And other days				

08-4686.00 DIVERSIONS FROM THE RIO GRANDE  
ANZALDUS CANAL NEAR REYNOSA, TAMAULIPAS

**DESCRIPTION:** Cableway, gravity well, and water-stage recorder located on the left bank at latitude 26°07'50", longitude 98°20'10", 0.5 canal mile (0.8 km) from the canal intake, and about 5 miles (8 km) northwest of Reynosa, Tamaulipas. The canal intake is immediately upstream from Anzalduas Dam at river mile 170.3 (274.1 km), 102.2 river miles (164.5 km) downstream from Falcon Dam. The zero of the gage is 86.32 feet (26.31 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 164 discharge measurements during the year, 145 by the Mexican Section and 19 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1952 through 1987.

**REMARKS:** Diversions by this canal are for irrigation and domestic use in Mexico and for conveying water for storage in Culebron, Villa Cardenas, and Palito Blanco Reservoirs about 23 canal miles (37.0 km) downstream from this station. During 1987, 484,692 acres (196,150 ha) were irrigated with water delivered through this canal. Flow at this canal station is affected by backwater from the operation of canal gates 4.5 miles (7.2 km), 11.3 miles (18.2 km), and 22.5 miles (36.2 km) below this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 10,950 second-feet (310 m<sup>3</sup>/sec) on June 2, 1957 with a gage height of 16.01 feet (4.88 m). Min. no flow occurs frequently.

		Average Flow in Second-Feet (Cubic Meters per Second)			
Daily:	Max.	9,360	(265)	April 23, 1983	Min. 0 Frequently
Monthly:	Max.	6,570	(186)	May 1983	Min. 0 Several months
Yearly:	Max.	1,980	(56.1)	1959	Min. 150 (4.26) 1952

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	381	221	242	1.4	5,580	7,630	3,440	249	1,410	646	1.4	1.4	
2	190	181	242	1.4	6,540	6,570	3,410	1.4	1,600	683	1.4	218	
3	1.4	54.0	242	1.4	7,350	6,040	3,340	1.4	798	643	1.4	388 *	
4	1.4	1.4	255	1.4	344	7,490	5,580	3,350	1.4	659	611	1.4	399
5	1.4	1.4	255	1.4	473	7,660	4,910	3,390	1.4	576	611	1.4	396
6	1.4	1.4	119	1.4	597	6,780	4,410	3,350	1.4	519	509	206	388
7	1.4	1.4	660	1.4	5,120	3,810	2,880	1.4	519	420	353	399	
8	82.3	1.4	671	1.4	4,310	2,230	2,610	1.4	618	431	147	413 *	
9	198	147	1.4	671	4,130	1,060	2,180	1.4	738	484	1.4	392 *	
10	198	364	1.4	766	4,240	999	1,810	1.4	826	604	262	1.4	
11	198	160	1.4	618	4,310	1,020	1,410	222	939	600	194	1.4	
12	198	1.4	706	4,270	780	989	445	939	593	448	1.4	1.4	
13	198	1.4	4,340	530	939	445	791	593	448	1.4	1.4	1.4	
14	231	1.4	869	3,990	494	1,080	445	837	731	448	1.4	1.4	
15	231	1.4	3,850	494	1,140	487	883	975	975	262	1.4	1.4	
16	238	1.4	1.4	964	3,780	494	964	720	901	975	1.4	1.4	
17	238	1.4	1.4	1,020	3,670	625	939	906	1,050	975	360	1.4	
18	98.9	212	1.4	1,150	3,640	600	819	918	1,360	975	537	309	
19	1.4	381	1.4	1,180	3,710	399	724	918	1,410	1,030	374	371	
20	1.4	381	1.4	1,200	4,100	1.4	724	862	1,250	1,130	360	512	
21	1.4	302	1.4	1,250	4,660	1.4	724	946	1,330	1,060	367	512 *	
22	1.4	198	1.4	1,300	5,090	1.4	710	946	1,410	1,230	364	256 *	
23	1.4	198	1.4	1,590	5,330	1.4	788	1,160	1,180	1,030	427	1.4	
24	1.4	198	1.4	1,980	5,400	353	865	1,370	1,040	883	424	1.4	
25	1.4	212	1.4	2,400	5,620	830	431	1,250	576	795	438	1.4	
26	1.4	212	1.4	3,010	5,830	1,370	1.4	1,240	353	692	445	1.4	
27	1.4	230	1.4	3,340	5,930	2,210	1.4	1,110	459	869	434	1.4	
28	91.8	242	1.4	3,600	5,860	3,010	252	961	646	720	1.4	189	
29	221	1.4	3,920	6,290	3,370	505	833	819	533	1.4	340	1.4	
30	221	1.4	4,450	6,920	3,570	480	759	731	597	1.4	113	480	
31	217			7,450		498	1,120						
<b>Sum</b>				3,908.4	41,138.4	63,403.6	18,326.6		22,589.4		6,394.6		
				3,450.6	2,166.8	163,340	44,743.8		27,207		7,051.4		

**Current Year 1987**

Month	Extreme Gage Feet			Average Second-Feet	Total Acre-Feet	Period 1954-1987		
	High	Low	Day			Average	Maximum	Minimum
Jan.	1	381	1.4	111	6,842	104,168	271,293	1,520
Feb.	119	381	1.4	139	7,750	91,612	251,519	1,086
Mar.	26	406	1.7	69.9	4,298	37,609	117,900	1,128
Apr.	30	4,450	1	1,370	81,618	139,892	370,715	23,381
May	5	7,660	18	5,260	323,960	213,090	403,665	28,291
June	1	7,630	120	2,120	125,770	98,640	270,700	14,221
July	1	3,440	126	1,440	88,764	44,657	162,400	5,730
Aug.	24	1,370	1.2	590	36,347	66,561	270,487	6,709
Sept.	2	1,600	26	908	53,970	58,031	165,800	2,177
Oct.	22	1,230	31	727	44,811	53,228	209,590	0
Nov.	18	537	1	235	13,991	12,838	83,690	0
Dec.	120	512	1.1	206	12,687	21,412	166,700	651
			7,660	1.4	1,100	800,808	961,831	1,434,920
<b>Yearly</b>	<b>Meters</b>			<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>	
				217	0.04	31.1	987,788	1,186,404
							1,770,162	680,817

\* Discharge measurement made on this day

0 Mean daily

! And other days

\*\* Average of several stations

08-4692.00 RIO GRANDE BELOW ANZALDAS DAM NEAR REYNOSA, TAMAULIPAS  
AND MISSION, TEXAS

**DESCRIPTION:** Cableway, gravity well, water-stage recorder, and seismograph transmitter, located on the right bank at latitude 26°07'50", longitude 98°19'55", and river mile 169.8 (273.3 km); 0.5 river mile (0.8 km) downstream from Anzalduas Dam, about 4.5 miles (7 km) northwest of Reynosa, Tamaulipas, and 10.3 river miles (16.6 km) upstream from the international highway bridge between Hidalgo, Texas and Reynosa, Tamaulipas. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 117 discharge measurements during the year, 103 by the Mexican Section and 14 by the United States Section of the Commission, and a continuous record of gage heights. Records available: 1952 through 1987.

REMARKS: Except during local storms, flow at this station is controlled largely by releases from Falcon Reservoir and by diversions into Anzalduas Canal. Excessive upstream flood flows are partly diverted into the United States floodway system inlet at Anzalduas Dam before reaching this station. Prior to January 1, 1968 the zero of the gage was 82.61 feet (25.18 m) above mean sea level, U. S. C. & G. S. datum. The transmitter relays gage height data to the Anzalduas Dam control room.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 131,000 second-feet (3,700 m<sup>3</sup>/sec) on September 24, 1967 with a gage height of 30.51 feet (9.30 m). Min. periods of no flow have occurred on several occasions in 1953, 1954, 1956, and 1957.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	121,000 (3,440)	Sept. 25, 1967	Min.	0	Occasionally
Monthly:	Max.	37,830 (1,070)	Oct. 1958	Min.	5.5 (0.16)	March 1957
Yearly:	Max.	6,410 (182)	1958	Min.	158 (4.49)	1957

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Mean Daily Discharge in Cubic Feet Per Second													
Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	105	138	364	717	2,320	3,710	2,900	254	4,450	2,050	3,640	869	
2	135	138	403	657	2,570	5,400	3,140	441	3,600	3,110	3,400	689	
3	374	138	410	805	2,510	2,270	3,190	614	2,180	3,670	3,150	501	
4	147	340	487	932	2,730	1,370	3,210	614	646	3,390	3,080	392	
5	265	*	322	459	1,250	3,450	1,090	2,970	516	1,150	2,780	2,520	456
6	313	438	565	1,350	4,240	883	2,980	512	1,110	2,580	1,820	480	
7	239	410	664	1,610	4,770	2,000	3,130	1,080	1,320	3,060	851	763	
8	232	*	424	569	1,620	4,130	3,170	1,330	1,120	4,660	763	770	
9	169	420	417	667	445	3,190	3,170	1,350	999	5,370	1,800	717	
10	145	540	519	480	*	325	1,120	2,710	1,340	862	4,450	1,750	551
11	188	657	653	324	523	989	2,240	1,280	2,720	3,850	908	343	
12	188	1,060	558	302	242	396	2,600	1,290	7,030	3,440	622	427	
13	234	1,030	315	657	237	150	2,580	1,330	6,820	3,240	470	544	
14	308	*	1,020	153	862	235	150	2,530	1,570	6,320	3,210	349	650
15	274	*	1,010	153	943	232	724	2,210	6,160	6,290	2,730	243	664
16	114	1,010	198	925	232	583	2,040	1,710	6,290	2,500	590	636	
17	117	1,090	243	731	323	151	2,020	1,750	5,860	2,560	410	664	
18	173	1,240	334	766	526	150	1,670	1,760	2,970	2,600	288	470	
19	234	*	1,210	374	1,190	600	153	1,840	1,670	2,340	2,490	413	396
20	237	879	*	330	*	1,130	805	153	1,860	1,590	2,780	2,330	385
21	237	*	713	351	1,520	*	1,360	234	1,850	1,700	2,250	2,350	371
22	234	*	569	629	1,540	752	*	315	1,960	1,720	2,230	2,540	833
23	134	*	403	763	2,010	745	378	*	1,830	1,890	2,630	2,680	703
24	74,2	544	*	766	1,800	1,560	622	1,760	1,980	*	2,750	2,960	249
25	231	600	759	1,870	1,670	826	*	1,650	1,820	1,410	3,330	565	562
26	188	*	749	579	1,880	1,440	*	1,200	1,590	1,520	4,480	3,070	413
27	138	682	501	1,890	*	1,910	1,960	1,120	1,360	3,310	2,670	805	1,080
28	143	466	420	1,920	2,240	*	3,110	1,700	1,299	3,530	*	2,660	1,090
29	223	554	*	1,960	2,560	2,700	551	1,360	2,270	2,720	713	1,100	
30	279	*	865	2,060	2,630	2,630	*	208	1,430	1,870	2,970	703	1,130
31	210	*	872	*	2,450	*	210	*	1,490	*	3,450	*	833

**Sum** 18,240 36,091 42,737 41,171 95,470 19,663  
6,282.2 15,227 48,262 66,589 96,587 34,172

**Current Year** 1987

**Period** 1954-1987

Month	Extreme Gage Feet			Extreme Second-Feet			Average Second- Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low	Day			Average	Maximum	Minimum
Jan.	79.00	77.43	3	501	!	74.2	203	12,463	97,228	325,550	1,090
Feb.	81.10	77.72	12	1,480	!	138	650	36,161	72,461	276,539	830
Mar.	80.18	77.16	31	982	13	145	491	30,204	76,777	243,477	339
Apr.	83.60	78.15	24	3,230	11	232	1,200	71,588	114,478	319,470	31,160
May	88.42	78.12	6	7,630	11	222	1,560	95,742	149,260	479,551	35,360
June	87.04	77.76	2	6,110	!	124	1,420	84,772	181,386	680,021	7,850
July	83.66	77.69	!	3,280	29	114	2,150	132,044	133,384	557,022	2,000
Aug.	81.89	78.05	24	2,000	1	203	1,330	81,687	135,292	1,207,862	943
Sept.	88.85	78.54	12	7,130	4	325	3,220	191,560	227,018	1,862,856	3,920
Oct.	87.14	79.00	9	5,860	21	487	3,080	189,353	268,428	2,260,000	1,730
Nov.	84.71	77.95	1	3,990	14	161	1,140	67,757	126,841	1,438,000	1,430
Dec.	80.64	77.72	27	1,220	24	118	636	38,982	95,893	540,100	1,500
	88.85	77.43		7,630		74.2	1,420	1,032,313	1,678,446	4,640,968	114,749
Yearly	Meters			Cubic Meters per Second			Thousands of Cubic Meters				
	27.08	23.60		216		2.10	40.3	1,273,346	1,973,066	5,724,004	141,538

- \* Discharge measurement made on this day

and other days

RIO GRANDE FLOODWAY DISCHARGES  
LOWER RIO GRANDE VALLEY

ON THE UNITED STATES SIDE

Part of the excess water from floods entering the Lower Rio Grande Valley is diverted from the river through the United States floodway system with the inlet located at Anzalduas Dam near Mission, Texas.

Floodwater entering the system is measured first at the Banker Floodway Station at Anzalduas Dam near Mission and again 25.2 miles (40.6 km) downstream at the Main Floodway Station on Farm Road No. 88 bridge south of Weslaco. At a point 3 miles (4.8 km) southwest of Mercedes the floodway divides, one channel going northeastward through the Arroyo Colorado Floodway to the Gulf of Mexico, and the other going to the gulf via the North Floodway, traveling first northward and then eastward to the gulf. At the point of diversion, a divisor dike, which runs longitudinally in the Main Floodway, divides and controls the flows into the Arroyo Colorado Floodway and the North Floodway. The flow of the Arroyo Colorado is measured at El Fuste Siphon south of Mercedes and farther downstream at the bridge on U. S. Highway No. 83 south of Harlingen. The North Floodway flow is measured at the bridge on old U. S. Highway No. 83 west of Mercedes and farther downstream at the bridge on U. S. Highway No. 77 near Sebastian.

In 1987, no flood flow was diverted through this floodway system.

ON THE MEXICAN SIDE

Part of the excess water from floods entering the Lower Rio Grande Valley is diverted from the river through the Mexican floodway system, with the inlet located 37.1 miles (59.7 km) downstream from Anzalduas Dam and, when necessary, through Anzalduas Canal located at Anzalduas Dam.

Floodwater entering the system through the Retamal Inlet flows into Culebron and Villa Cardenas Lakes through the Retamal Floodway, while flood flows entering the canal at Anzalduas Dam reach these lakes via the Culebron and Retamal Canals from where it flows in a southeastwardly direction via Floodway No. 1 into the Gulf of Mexico.

The Retamal Floodway replaces the previously used floodway system, which consisted of Retamal Canal, San Rafael Floodway, and Floodway No. 2.

In 1987, no flood flow was diverted through Retamal Floodway or Anzalduas Canal.

08-4732.00 DIVERSIONS FROM THE RIO GRANDE  
UNITED STATES SIDE, ANZALDUAS DAM TO PROGRESO

Beginning June 1971, the Texas Water Rights Commission, now the Texas Water Commission, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1987, 125,370 irrigable acres (50,737 ha) and several towns and rural homes were allotted Rio Grande water in the river reach between Anzalduas Dam and the Progreso International Bridge. Such irrigable area was 17.4% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1987 in this river reach was 193,407 acre-feet (238,564,000 m<sup>3</sup>), or 21.6% of the total water diverted from the Rio Grande below Falcon Dam. About 91% of the water diverted in this river reach was determined by the International Boundary and Water Commission through records of discharge obtained by means of flow meters, and by deflection meters developed by the Commission. The records for the rest of these diversions were furnished by the Rio Grande Watermaster and were determined from records of discharge obtained by means of flow meters. More than one crop per year is often grown on parts of this land.

## EXTREME FLOWS FROM RECORDS:

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 1,120 (31.7)	June 16 & 17, 1965	Min. 0	Occasionally
Monthly:	Max. 749 (21.2)	June 1969	Min. 13.3 (0.38)	May 1972
Yearly:	Max. 367 (10.4)	1982	Min. 167 (4.73)	1970

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	64.6	458	585	561	842	13.7	308	72.2	254	344
2	0	20.8	80.9	421	457	422	812	22.4	229	52.1	435	287
3	0	27.8	112	395	537	232	767	225	214	43.2	454	300
4	0	107	184	353	671	102	665	249	173	93.5	481	182
5	20.5	182	256	366	630	59.3	534	237	69.5	210	453	86.7
6	31.4	114	185	422	414	63.9	822	329	76.5	273	399	91.7
7	162	58.6	105	498	150	30.7	878	353	233	304	256	267
8	176	35.5	99.6	446	146	108	875	332	290	313	312	315
9	87.0	191	248	354	19.7	112	852	294	316	250	334	328
10	13.0	214	270	267	16.2	108	601	364	294	177	249	346
11	4.9	196	380	146	26.2	30.0	416	380	347	223	106	226
12	25.6	194	333	148	39.5	17.4	363	463	352	135	157	157
13	28.7	394	167	283	39.5	1.1	662	466	309	481	78.5	237
14	59.2	293	40.3	285	44.8	16.4	698	425	388	468	20.7	327
15	117	239	35.2	362	45.6	38.6	639	345	462	442	18.3	346
16	59.8	310	85.3	435	24.3	106	624	329	490	364	143	357
17	7.3	339	101	330	16.8	25.4	603	541	482	259	232	337
18	0	341	173	259	208	27.8	434	594	465	298	245	191
19	19.6	364	230	291	266	27.1	401	563	377	438	255	94.3
20	28.1	249	157	531	302	12.2	642	552	351	531	149	198
21	28.1	120	79.3	541	336	4.5	675	451	380	497	53.5	216
22	159	106	188	577	240	63.0	531	359	320	383	139	163
23	69.4	144	361	597	184	71.4	397	336	270	302	294	211
24	0	223	368	381	332	216	514	475	316	162	339	63.1
25	0	270	376	187	450	433	267	452	207	112	207	1.9
26	0	147	389	333	450	380	93.4	382	77.3	278	51.3	1.9
27	0	94.8	329	517	500	495	158	294	214	276	273	24.6
28	19.8	55.0	230	584	476	475	142	244	294	286	168	260
29	27.7	233	578	480	805	120	208	103	291	84.8	304	
30	72.2	346	595	479	796	29.6	202	94.9	251	312	302	
31	34.1	366	457			38.4	360		181			184

Sum	5,029.5	11,940	5,838.8	10,840.1	8,756.0	6,749.2
	1,250.4	6,532.2	9,022.6	16,095.4	8,502.2	6,953.1

## Current Year 1987

## Period 1957-1987

Month	Average Rainfall		Extreme Second-Feet		Average	Total	Acre-Feet		
	Inches**	1957-1987	High Day	Low Day			Average	Maximum	Minimum
Jan.	2.46	1,49	8	176	1	0	40.3	2,480	12,006
Feb.	1.99	1,41	13	394	1	0	180	9,976	9,925
Mar.	.62	.67	11	380	15	35.2	211	12,056	28,535
Apr.	.57	1,43	23	597	11	146	398	16,644	1,140
May	3.54	2.88	4	671	10	16.2	291	20,961	1,050
June	4.44	2.72	29	845	13	.1	195	11,581	39,277
July	2.76	1.71	7	878	30	29.6	519	31,925	3,530
Aug.	.83	2.38	18	594	1	13.7	350	21,501	21,478
Sep.	3.80	4.21	16	490	5	69.5	283	17,160	44,541
Oct.	.62	2.65	20	531	3	43.2	282	14,262	4,203
Nov.	1.33	1.22	4	481	15	18.3	232	13,791	23,286
Dec.	.55	1.15	16	357	125	1.9	218	13,387	41,100
	23.51	23.92		878		0	267	193,407	265,366
Yearly	Millimeters		Cubic Meters per Second				Thousands of Cubic Meters		
	597	608	24.9	0	7.56	238,564	241,133	327,324	149,261

\*\* United States side - average of several stations in the reach

θ Mean daily

! And other days

08-4736.00 DIVERSIONS FROM THE RIO GRANDE  
UNITED STATES SIDE, PROGRESO TO SAN BENITO

Beginning June 1971, the Texas Water Rights Commission, now the Texas Water Commission, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1987, 319,610 irrigable acres (129,346 ha) and several towns and rural homes were allotted Rio Grande water in the river reach between Progreso and the gaging station at San Benito. Such irrigable area was 44.5% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1987 in this river reach was 372,703 acre-feet (459,722,000 m<sup>3</sup>), or 41.7% of the total water diverted from the Rio Grande below Falcon Dam. About 97% of the water diverted in this river reach was determined by the International Boundary and Water Commission through records of discharge obtained by means of flow meters, by open channel rating stations, and by deflection meters developed by the Commission. The records for the rest of these diversions were furnished by the Rio Grande Watermaster and were determined from records of discharge obtained by means of flow meters. More than one crop per year is often grown on parts of this land.

## EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet (Cubic Meters per Second)											
Daily:	Max.	2,750 (77.9)		June 15, 1965		Min.	0		Occasionally		
Monthly:	Max.	2,080 (58.9)		June 1960		Min.	53.5 (1.52)		March 1957		
Yearly:	Max.	808 (22.9)		1980		Min.	367 (10.4)		1968		

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	156	155	420	391	1,230	1,020	1,460	109	984	132	558	336
2	57.1	60.5	251	407	1,100	1,060	1,730	87.6	1,200	142	599	250
3	.1	0	179	396	1,270	1,260	1,970	245	1,000	129	620	175
4	.1	46.4	268	329	1,420	857	1,970	353	839	45.4	632	98.1
5	158	61.1	324	292	808	787	1,760	379	550	55.5	656	200
6	208	45.0	340	539	669	570	1,850	288	601	260	722	247
7	179	0	266	573	698	390	2,010	263	791	343	488	289
8	126	0	260	377	712	266	1,770	327	917	402	428	416
9	17.0	0	193	413	563	349	1,680	339	684	460	470	404
10	38.8	28.8	165	372	623	466	1,810	630	469	336	543	405
11	79.2	72.4	175	279	355	480	1,540	787	383	386	634	350
12	109	73.2	238	280	192	255	1,190	819	336	493	628	198
13	116	46.9	390	298	188	.1	1,560	750	413	509	615	155
14	144	0	78.0	159	65.1	.1	1,650	812	682	582	419	250
15	113	211	0	252	62.1	40.0	1,510	850	1,040	631	238	370
16	108	624	0	350	83.5	112	1,360	625	941	565	126	353
17	41.5	729	.5	543	45.0	99.9	1,550	952	920	565	142	348
18	73.1	796	92.1	502	88.1	85.3	1,430	970	956	582	102	287
19	90.6	722	209	264	217	106	1,020	958	861	641	98.6	156
20	162	933	264	701	348	79.7	1,140	808	777	656	320	197
21	228	795	180	820	415	40.2	1,080	915	739	634	341	382
22	114	607	163	882	496	64.6	1,040	878	460	621	336	391
23	28.7	388	295	1,020	553	164	1,000	726	303	651	381	381
24	.1	259	408	1,010	538	282	1,040	940	243	464	338	213
25	.1	259	433	992	642	317	993	1,020	414	465	344	126
26	124	301	207	1,100	898	426	626	1,010	402	571	384	154
27	190	449	285	1,040	998	562	645	928	341	619	382	166
28	96.8	438	278	1,040	1,180	825	602	886	239	598	257	621
29	123	321	1,080	1,250	1,240	598	708	192	721	234	784	
30	104	263	1,060	1,500	1,530	325	712	188	645	336	810	
31	131	336	1,590	1,590	1,590	135	949	569				837
<b>Sum</b>			8,100.3	17,761	13,733.9		21,023.6		14,472.9		10,349.1	
			3,116.2	7,273.6	20,792.8		40,044		18,865		12,371.6	

## Current Year 1987      Period 1957-1987

Month	Average Rainfall		Extreme Second-Feet	Average	Total	Acre-Feet		
	Inches**	1987	1957-1987	Day	Day	Low	Second-Feet	Average
Jan.	3.28	1.66	21	228	1.3	0.1	101	6,181
Feb.	2.81	1.79	20	933	1.3	0	289	16,067
Mar.	1.02	.79	25	433	1.15	0	235	14,427
Apr.	.75	1.58	26	1,100	14	159	592	35,228
May	3.60	3.06	31	1,590	17	45.0	671	41,242
June	5.60	3.15	30	1,530	1.13	.1	458	27,241
July	2.30	2.13	7	2,010	31	135	1,290	79,426
Aug.	.55	2.79	25	1,020	2	87.6	678	41,700
Sept.	3.97	5.10	2	1,200	30	188	629	33,580
Oct.	.49	3.01	29	721	4	45.4	467	24,059
Nov.	2.19	1.61	6	722	19	98.6	412	24,539
Dec.	.26	1.38	31	837	4	98.1	334	20,527
	26.82	28.05		2,010		0	515	372,703
								414,729
								586,544
								266,680
Yearly	Millimeters		Cubic Meters per Second			Thousands of Cubic Meters		
	681	712		56.9		0	14.6	459,722
								511,560
								723,490
								328,944

\*\* United States side - average of several stations in the reach

† Mean daily

‡ And other days

08-4737.00 RIO GRANDE NEAR SAN BENITO, TEXAS  
AND RAMIREZ, TAMAULIPAS

**DESCRIPTION:** Cableway, concrete control weir, bubbler gage, water-stage recorders (graphic and digital), and digital transmitter, located on the left bank at latitude 26°01'50", longitude 97°43'40", and river mile 96.8 (155.8 km), 3.9 river miles (6.3 km) downstream from San Benito pumping plant and about 9.5 miles (15.3 km) southwest of San Benito, Texas. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 35 discharge measurements during the year and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: November 26, 1952 through August 25, 1953, and December 1953 through 1987.

**REMARKS:** Except for diversions, tributary inflows, and drainage returns below Falcon Dam, flow at this station after August 25, 1953 was controlled largely by releases from Falcon Reservoir, 178.0 river miles (286.4 km) upstream. Excessive upstream flood flows are partly diverted through the United States and Mexican floodway systems before reaching this station. The transmitter relays gage height data via radio to the Mercedes office of the Commission, where it is recorded automatically, and to the Anzalduas Dam Control Room for visual readout. The concrete control weir was constructed in December 1965, and the gage was moved to its present location just above the weir on January 4, 1967.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 25,000 second-feet (708 m<sup>3</sup>/sec) on September 29, 1957 with a gage height of 61.05 feet (18.61 m). Min. no flow occurs frequently.

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max. 24,800 (702)	Sept. 29, 1957	Min. 0	Frequently
Monthly:	Max. 14,300 (405)	Oct. 1971	Min. 39.5 (1.12)	December 1956
Yearly:	Max. 3,780 (107)	1976	Min. 200 (5.66)	1956

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	166	131	219	*50.5	*81.2	568 *	203	201	356	1,20	2,440	319
2	130 *	156	140 *	59.5	170	1,630	192	181	1,700 *	1,860	2,700 *	236 *
3	154	203 *	179	56.5	811	2,790	309	176 *	2,440	2,520	2,480	363
4	199	178	166	50.5	497	2,030	514	166	2,060 *	3,120	2,230	350
5	276	153	97.6	54.3	869	765	797	111	92.5	3,150	2,100	248
6	102	176	88.8	64.1	2,090	196	1,060	121	176	2,530	1,580	120
7	*72.2	231	112	256	2,980	231	566	102	85.6	1,950	1,250	103
8	75.2	318	135	478	2,810	1,090	501	115	85.3	2,140	483	96.5
9	99.1	476	290	371	3,020	2,750 *	907	526	43.0	3,080	269	109
10	126	431	288	185	1,020	2,830	730	503	84.9	3,800	494	107
11	94.4	297	163	97.4	196	1,510	421	268	200	3,800	982	88.6
12	87.2	363	124	79.2	250	749 *	577	198	845	3,250	553	128
13	112	626	*83.8	75.5	320	1,090	970	114	3,940	2,640	249	127
14	114	936	83.4	77.4	205 *	645	399	120	51,150	2,240	173	104
15	118	924	166	*74.7	188	416	336	156	4,590 *	2,020 *	119	*77.1
16	125 *	581	161	97.0	203	312	260	410	4,210 *	1,780	217	63.9
17	171	148 *	146	89.4	162	749	128 *	467 *	4,230	1,570	348 *	60.7
18	189	123	107	65.2	216	438	73.0	206	4,070 *	1,640	377	52.6
19	172	121	66.4	62.3	213	174	62.3	176	2,830	1,620	269	94.3
20	145	242	59.2	65.7	134	147	149	187	1,700	1,430	110	194
21	103	173	60.5	67.0	183	139	279	223	1,580 *	1,160	72.0	105
22	89.3	172	70.8	62.7	470	194	162	272	1,660	977	62.8	69.7
23	104	253	69.1	55.1	407	152	200	402	1,620 *	1,520	61.5	70.6
24	203	369	57.8	57.5	126	77.0	532	883	1,940	1,800	211	70.1
25	182	222	48.5	164	319	60.1	548	581	1,800	2,200	205	91.2
26	144	158	46.8	327	355	52.9	753	554	2,760	2,480	189	184
27	99.6	185	53.4	331	132	46.1	1,110	369	3,310	2,280	114	353
28	91.8	304	54.5	252	159	310	799	269	3,090	1,890	271	459
29	95.3		51.3	146	298	1,140	1,070	610	2,750	1,650	365	188
30	106		48.5	88.7	511	632	772	501	2,220	1,640	420	113
31	135		47.2		333		377	607		2,010		83.3
<b>Sum</b>			8,650	3,960.2	23,913.1	9,865		67,667		4,828.6		
			4,090.1	3,483.6	19,728.2	15,756.3		61,648.3		21,394.3		

Current Year 1987							Period 1954-1987					
Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet					
	High	Low	Day	Day			Average	Maximum	Minimum			
Jan.	35.61	34.91	5	344	7	66.4	132	8,113	50,141	319,002	2,920	
Feb.	36.25	35.04	14	936	19	106	309	17,157	45,947	363,000	3,380	
Mar.	35.58	34.79	10	332	25	43.8	112	6,910	37,330	360,000	2,560	
Apr.	35.97	34.75	8	599	23	40.9	132	7,855	43,580	251,919	7,855	
May	42.22	34.96	9	3,520	1	76.8	636	39,130	71,103	382,973	16,873	
June	41.59	34.76	9	3,020	127	45.3	797	47,431	79,371	525,330	16,100	
July	39.19	34.81	10	2,360	19	53.4	508	31,252	75,512	447,886	4,690	
Aug.	36.95	34.94	24	1,500	8	79.1	318	19,567	78,721	827,107	3,100	
Sept.	47.28	35.09	14	0	5,150	9	28.3	2,050	122,278	136,694	638,757	7,710
Oct.	44.58	36.46	110	0	3,800	22	742	2,180	134,215	169,906	880,859	3,890
Nov.	40.99	34.84	2	2,740	23	57.5	713	42,435	77,454	602,000	5,640	
Dec.	35.95	34.82	28	573	16	46.7	156	9,577	67,991	479,000	2,430	
		47.28	34.75	0	5,150		28.3	671	485,920	933,750	2,743,424	145,520
Yearly			Meters			Cubic Meters per Second			Thousands of Cubic Meters			
			14.41	10.59		146	0.80	19.0	599,373	1,151,762	3,383,959	179,496

\*\* Period 1954-1987  
! And other days

\* Discharge measurement made on this day

Ø Mean daily

08-4749.00 DIVERSIONS FROM THE RIO GRANDE  
UNITED STATES SIDE, SAN BENITO TO BROWNSVILLE

Beginning June 1971, the Texas Water Rights Commission, now the Texas Water Commission, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1987, 85,076 irrigable acres (34,430 ha) and several towns and rural homes were allotted Rio Grande water in the river reach between the gaging stations near San Benito and Brownsville. Such irrigable area was 11.8% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1987 in this river reach was 97,439 acre-feet (120,189,000 m<sup>3</sup>), or 10.9% of the total water diverted from the Rio Grande below Falcon Dam. About 90% of the water diverted in this river reach was determined by the International Boundary and Water Commission through records of discharge obtained by means of flow meters and by deflection meters developed by the Commission. The records for the rest of these diversions were furnished by the Rio Grande Watermaster and were determined from records of discharge obtained by means of flow meters. More than one crop per year is often grown on parts of this land.

## EXTREME FLOWS FROM RECORDS:

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 782 (22.1)	June 14, 1963	Min. 0	Occasionally
Monthly:	Max. 542 (15.3)	June 1965	Min. 18.5 (0.52)	February 1966
Yearly:	Max. 223 (6.32)	1965	Min. 98.3 (2.78)	1981

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	27.1	35.9	39.4	128	119	531	492	146	106	37.2	41.3	261
2	51.5	34.4	33.8	215	129	524	366	158	106	42.5	43.4	111
3	30.2	29.4	65.0	70.4	190	559	309	132	306	38.7	69.1	45.0
4	37.6	29.9	54.0	58.2	322	662	300	145	323	38.7	73.5	39.0
5	38.7	32.2	17.0	54.2	329	592	348	146	160	178	62.9	36.5
6	32.8	22.1	47.4	55.4	320	397	477	128	154	338	62.9	35.4
7	57.5	35.9	59.3	201	252	247	566	92.5	102	199	54.0	31.0
8	44.2	30.4	42.5	255	230	125	637	87.1	104	64.2	59.3	32.6
9	47.1	173	179	197	116	73.9	613	89.9	110	67.5	54.0	27.3
10	32.5	261	282	52.9	89.6	88.0	615	284	214	47.5	10.6	37.2
11	43.0	109	208	52.9	86.9	102	618	468	138	58.5	0	36.0
12	39.9	36.4	37.8	50.7	86.4	174	526	416	123	58.0	0	31.3
13	58.9	36.4	24.0	53.5	90.1	54.6	556	312	138	49.3	0	38.7
14	18.7	33.4	50.1	107	252	36.7	555	145	365	67.5	0	26.8
15	42.8	29.4	41.7	106	185	21.5	421	157	407	68.6	0	70.9
16	58.9	35.9	17.8	59.8	48.6	37.3	379	146	262	64.8	21.9	74.2
17	43.9	35.4	30.9	76.4	67.9	43.5	375	327	334	61.0	38.1	67.5
18	43.9	28.0	49.3	71.8	185	37.3	282	428	277	53.5	38.4	60.9
19	38.8	22.8	42.2	53.4	250	42.3	116	332	123	42.1	43.4	42.4
20	35.4	47.9	40.6	55.9	150	37.3	128	164	93.7	92.3	190	42.3
21	16.4	39.8	49.3	53.5	168	37.3	110	141	172	226	57.3	45.8
22	38.3	17.0	36.6	88.8	99.6	37.3	293	126	124	303	38.5	57.0
23	55.5	43.0	4.8	90.4	90.8	79.1	435	111	99.2	103	80.1	44.6
24	55.5	47.8	0	86.4	89.8	93.6	377	306	92.1	75.7	85.1	51.9
25	41.7	17.0	14.4	82.0	142	72.4	360	415	93.6	50.9	139	31.3
26	40.0	44.3	36.5	79.3	148	75.0	342	459	60.4	50.9	38.1	18.2
27	35.7	48.7	45.3	255	238	66.8	378	408	41.6	37.9	35.0	16.9
28	36.7	20.9	76.2	319	252	66.6	358	239	41.6	37.9	35.0	145
29	42.2		80.7	322	254	283	347	111	33.6	35.3	35.0	203
30	29.7		54.8	232	264	438	251	118	21.6	38.9	200	152
31	48.2		19.0	308		212	123			35.3		16.6

Sum 1,377.3 3,582.9 5,634.5 6,860.5 2,661.7 1,929.3  
1,273.3 1,779.4 5,552.7 12,142 4,725.4 1,605.9

## Current Year 1987

## Period 1957-1987

Month	Average Rainfall		Extreme Second-Feet		Average Second- Foot	Total Acre-Feet	Acre-Feet		
	1987	1957-1987	Day	Day			Average	Maximum	Minimum
Jan.	2.99	1.80	113	58.9	21	16.4	41.1	2,526	10,236
Feb.	2.52	1.73	10	261	122	17.0	49.2	2,732	7,012
Mar.	.85	.68	10	282	24	0	57.4	3,529	6,831
Apr.	1.08	1.75	29	322	12	50.7	119	7,107	11,714
May	2.50	2.98	5	329	18	48.6	179	11,014	14,902
June	5.09	3.08	4	662	15	21.5	188	11,176	16,221
July	1.90	2.06	8	637	21	110	392	24,083	11,935
Aug.	.61	2.96	11	468	8	87.1	221	13,608	8,700
Sept.	3.86	5.66	15	407	30	21.6	158	9,373	14,556
Oct.	1.78	3.06	6	338	129	35.3	85.9	5,279	5,718
Nov.	3.06	1.64	30	200	111	0	53.5	3,185	4,667
Dec.	.19	1.58	1	261	31	16.6	62.2	3,827	5,304
	26.43	28.98		662		0	135	97,439	109,321
Yearly							Acre-Feet		
	Millimeters		Cubic Meters per Second				Thousands of Cubic Meters		
	671	736		18.7		0	3.82	120,189	134,845
								199,211	87,788

\*\* United States side - average of several stations in the reach

0 Mean daily

1 And other days

08-4750.00 RIO GRANDE NEAR BROWNSVILLE, TEXAS  
AND MATAMOROS, TAMAULIPAS

**DESCRIPTION:** Cableway, bubbler gage, water-stage recorders (graphic and digital), and digital transmitter located on the left bank at latitude 25°52'35", longitude 97°27'20", and river mile 48.7 (78.3 km), 0.2 river mile (0.3 km) downstream from El Jardín pumping plant, and 7.0 river miles (11.2 km) downstream from the international highway bridge (Gateway) between Brownsville, Texas and Matamoros, Tamaulipas. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 28 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1938 through 1987.

**REMARKS:** Except for diversions, tributary inflows, and drainage returns below Falcon Dam, flow at this station after August 25, 1953 was controlled largely by releases from Falcon Reservoir, 225.1 miles (363.9 km) upstream. Excessive upstream flood flows are partly diverted into the United States and Mexican floodway systems before reaching this station. The transmitter relays gage height data via radio to the Mercedes office of the Commission, where it is recorded automatically, and to the Anzalduas Dam Control Room for visual readout.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 31,700 second-feet (898 m<sup>3</sup>/sec) on October 8, 1945 with a gage height of 31.48 feet (9.60 m). Min. no flow occurs frequently.

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max. 16,200 (459)	Oct. 19 & 20, 1971	Min. 0	Frequently
Monthly:	Max. 14,400 (408)	Oct. 1971	Min. 3.5 (0.10)	August 1957
Yearly:	Max. 3,640 (103)	1976	Min. 42.1 (1.19)	1956

**Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary**

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	128	136	194	*48.1	0	*38.8	186 *	257	214 *	2,250 *	2,060	227 *
2	123 *	163 *	213 *	36.4	0	46.9	20.1	156	188	1,840	2,420 *	232
3	112	120	149	21.3	0	87.3	11.4	111 *	1,080	1,880	2,570	215
4	119	149	122	14.1	66.0	1,650	7.7	104	1,670	2,400	2,360	341
5	129	227	147	11.3	68.2	1,060	4.5	79.9	1,280	2,820	2,150	365
6	228	252	119	25.1	286	538	19.9	60.8	555	2,620	1,930	302
7	152	198	79.1	42.6	1,330	259	203	59.1	484	2,080	1,540	200
8	82.0	190	83.8	115	1,850 *	385	79.1	50.3	401	1,870	1,250	153
9	68.3	216	116	192	2,210	1,150	8.5	42.3	318	2,180	881	139
10	62.8	171	70.8	204	1,940	2,330 *	126	163	199	2,890	583	153
11	80.6	175	66.7	166	784	2,440	120	118	136	3,480	685	142
12	92.8	223	93.2	153	272	1,340	35.6	17.8	253	3,590	950	151
13	84.2	243	148 *	104	225	785	70.1	1.8	1,150	3,160	707	169
14	98.0	464	122	61.5	201	850	209	0	3,580 *	2,580	438	164
15	111	728	90.4	*56.3	27.1	698 *	100	0	3,850 *	2,180	311	131
16	*90.3	658	122	60.0	28.4	477	50.2	0	4,110 *	1,920	263 *	*95.2
17	80.6	486	184	48.3	72.6	476	*49.9	*.6	3,920 *	1,740	267	83.2
18	124	226 *	174	44.9	58.3	514	6.4	32.6	3,760	1,620	341	89.1
19	131	136	132	47.5	17.4	442	1.2	6.2	3,580	1,510 *	409	86.4
20	146	102	109	42.9	5.8	23	.2	0	2,520	1,540	317	88.7
21	162	94.8	84.9	42.2	4.5	171	.1	0	1,570	1,360	115	165
22	139	103	70.2	40.0	2.2	130	39.4	0	1,440	1,060	132	132
23	75.4	79.5	84.0	28.1	50.9	123	10.7	29.4	1,440	1,230	138	89.8
24	64.5	69.2	107	17.8	136	137	1.2	139	1,590	1,530	105	67.5
25	99.3	141	105	11.1	44.1	101	0	97.3	1,840	1,840	144	70.8
26	149	174	74.7	10.1	31.6	63.2	77.5	18.9	1,980	2,180	186	84.1
27	127	150	46.8	105	146	85.0	256	11.2	2,740	2,360	325	126
28	104	153	37.9	63.3	28.8	36.1	416	5.5	3,320	2,170	223	247
29	81.0	29.9	16.3	2.8	130	315	1.9	3,180	1,860	222	273	
30	75.9	37.1	.5	2.8	391	461	35.2	2,850	1,690	339	136	
31	81.1	52.7	51.4			395	139		1,760			99.4
<b>Sum</b>		6,227.5	1,828.7		17,829.0		1,737.8		65,290		5,017.2	
	3,400.8	3,265.2	9,942.9		3,280.7		55,198		24,391			

**Current Year 1987**

**Period 1954-1987**

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.	4.24	2.95	6	253	23	62.3	110	6,745	40,533	330,268
Feb.	6.82	3.07	15	750	24	67.2	222	12,352	40,016	362,000
Mar.	4.19	2.57	2	221	129	29.2	105	6,476	32,122	361,000
Apr.	4.12	1.91	10	240	30	0	61.0	3,627	30,491	219,590
May	13.01	1.85	9	2,440	1	0	321	19,721	55,262	256,795
June	13.29	2.53	11	2,590	2	18.1	594	35,363	62,164	486,551
July	5.65	1.88	30	531	25	0	106	6,507	65,929	437,546
Aug.	4.46	1.86	1	295	114	0	56.1	3,447	68,733	812,033
Sept.	17.56	3.06	16	4,110	11	113	1,840	109,484	123,381	635,722
Oct.	16.73	8.04	12	3,630	22	996	2,110	129,501	158,654	887,207
Nov.	13.31	3.12	3	2,590	25	92.4	813	48,379	73,309	528,000
Dec.	5.34	2.74	4	424	124	55.8	162	9,951	65,648	480,000
	17.56	1.85		0 4,110		0	541	391,553	816,242	2,645,434
<b>Yearly</b>	<b>Meters</b>			<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>			
	5.35	0.56		116		0	15.3	482,973	1,006,818	3,263,090
										37,740

\*\* Period 1954-1987

\* Discharge measurement made on this day

o Mean daily

! And other days

08-4753.00 DIVERSIONS FROM THE RIO GRANDE  
UNITED STATES SIDE, BROWNSVILLE TO THE GULF OF MEXICO

Beginning June 1971, the Texas Water Rights Commission, now the Texas Water Commission, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1987, 4,212 irrigable acres (1,705 ha) were allotted Rio Grande water in the river reach between the gaging station near Brownsville and the mouth of the Rio Grande. Such irrigable area was 0.6% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1987 in this river reach was 828 acre-feet (1,021,000 m<sup>3</sup>), or 0.1% of the total water diverted from the Rio Grande below Falcon Dam. All records of diversions in this river reach, which were determined by means of flow meters, were furnished by the Rio Grande Watermaster. More than one crop per year is often grown on parts of this land.

## EXTREME FLOWS FROM RECORDS:

## Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 67.7 (1.92)	May 1, 1984	Min. 0	Frequently
Monthly:	Max. 23.4 (0.66)	June 1965	Min. 0	Occasionally
Yearly:	Max. 7.0 (0.20)	1965	Min. 0.7 (0.02)	1976

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	4.2	3.4	18.8	0	6.7	3.4	3.5	0.6	0	0	7.6
2	0	0	3.4	7.5	0	10.6	3.4	3.5	0.6	0	0	7.6
3	0	0	0	1.7	0	10.6	3.4	3.5	0.6	0	0	7.6
4	0	0	0	1.7	2.4	5.1	0	0	4.2	0	0	3.2
5	0	0	0	0	0	5.1	0	0	4.2	0	0	3.2
6	0	0	0	0	1.1	9.6	0	0	4.2	0	0	3.2
7	0	0	0	0	1.1	5.7	0	0	7.8	0	0	3.2
8	0	0	0	0	3.5	0.2	0	0	4.1	0	0	3.2
9	0	0	0	0	1.1	0.2	0	0	4.1	0	0	0
10	0	0	0	0	1.1	0.2	0	0	1.7	0	0	0
11	0	0	0	0	1.1	0.2	7.6	2.9	1.7	0	0	0
12	0	0	0	0	4.6	0.2	7.6	2.9	1.7	0	0	0
13	0	0	0	0	4.6	0.2	7.6	2.9	0.6	0	0	0
14	0	0	0	0	3.5	0.2	10.5	2.9	1.7	0	0	0
15	0	0	0	0	0	0.2	7.5	2.9	1.7	0	0	0
16	0	0	0	0	0	0.2	7.5	0	1.7	0	0	0
17	0	0	0	0	0	0.2	4.2	0	1.7	0	0	0
18	0	0	0	0	0	0.2	10.4	1.4	1.7	0	0	0
19	0	0	0	0	0	0.2	6.2	1.4	0.6	1.3	0	0
20	0	0	0	0	0	0.2	6.2	1.4	0.6	1.3	0	0
21	0	0	0	0	0	0.2	0	0	5.1	1.3	0	0
22	0	0	0	0	2.4	0.2	0	0	5.1	0	0	0
23	0	0	0	0	2.4	0.2	0	0	5.1	0	0	0
24	0	0	3.5	0	2.4	0.2	0	0	0.6	0	0	0
25	0	0	3.6	0	7.6	0.2	0	0	0.6	0	0	0
26	0	0	3.6	0	7.6	0.2	0	0	0.6	0	0	0
27	0	0.1	7.6	0	7.6	0.2	0	0	0.6	0	0	0
28	0	0.1	7.6	0	7.6	0.2	0	0	0.6	0	0	0
29	0	0.1	7.6	0	7.6	0.2	0	0	0.6	0	0	0
30	0	0.1	7.6	0	7.6	0.2	0	0	0.6	0	0	0
31	0	0.1	4.5	0	0	0	0	0	0	0	0	0
Sum		4.2	29.7		58.0	29.2			3.9			38.8
	0	18.0	81.4		85.5	68.9			0			

## Current Year 1987

## Period 1957-1987

Month	Average Rainfall		Extreme Second-Feet		Average	Total	Acre-Feet		
	_inches**	1957-1987	Day	Day			Average	Maximum	Minimum
Jan.	3.00	1.82	1 1	0 ! 1	0	0	360	1,275	0
Feb.	3.38	1.70	1	4.2 ! 2	0	0.2	8.3	223	0
Mar.	.69	.61	125	3.6 ! 3	0	0.6	35.7	131	634
Apr.	1.30	1.79	1	18.8 ! 5	0	1.0	58.9	256	962
May	1.60	2.79	125	7.6 ! 1	0	2.6	161	386	1,356
June	4.69	2.90	! 2	10.6 ! 8	0.2	1.9	115	417	1,393
July	1.57	2.01	14	10.5 ! 4	0	2.8	170	185	778
Aug.	.37	2.90	! 1	3.5 ! 4	0	0.9	57.9	110	317
Sept.	5.73	5.84	.7	7.8 ! 1	0.6	2.3	137	52.6	190
Oct.	3.57	3.04	! 19	1.3 ! 1	0	0.1	7.7	60.5	218
Nov.	3.28	1.74	! 1	0 ! 1	0	0	0	59.3	252
Dec.	.21	1.64	! 1	7.6 ! 9	0	1.3	77.0	77.1	335
Yearly	29.39	28.78		18.8	0	1.1	828	2,318	5,036
	Millimeters		Cubic Meters per Second			Thousands of Cubic Meters			
	747	731	0.53	0	0.03	1,021	2,859	6,212	670

\*\* United States side - average of several stations in the reach

! Mean daily ! And other days

08-4754.00 DIVERSIONS FROM THE RIO GRANDE  
UNITED STATES SIDE, FALCON DAM TO THE GULF OF MEXICO

Beginning June 1971 the Texas Water Rights Commission, now the Texas Water Commission, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

In 1987, 718,938 irrigable acres (290,955 ha), several towns and many rural homes were allotted Rio Grande water between Falcon Dam and the Gulf of Mexico. The total diversion from the river was 893,863 acre-feet (1,102,562,000 m<sup>3</sup>). About 91% of the water diverted was determined through records of discharge obtained by means of flow meters, by open channel rating stations, and by deflection meters developed by the Commission. The records for the balance of the diversions were furnished by the Rio Grande Watermaster and were determined from records of discharge obtained by means of flow meters. Drainage from more than 90% of this area does not return to the Rio Grande, but some of it is reused within the area. More than one crop per year is often grown on parts of this land.

Division data pertaining to "Diversions from the Rio Grande-United States Side below Rio Grande City" for the period 1922 through 1957 may be found in previous issues of these Water Bulletins. The area irrigated below Rio Grande City is about 99% of the total acreage irrigated on the United States side below Falcon Dam.

A breakdown by river reaches of the total diversion below Falcon Dam shown in the tabulation below may be found in appropriate downstream order in preceding pages of this Water Bulletin. Because the mean daily discharges are rounded, the total acre-feet shown in the summary below may not equal the sum of the acre-feet of the individual reaches.

## EXTREME FLOWS FROM RECORDS:

	Average Flow in Second-Feet (Cubic Meters per Second)					
Daily:	Max.	5,380 (152)	June 20 & 21, 1960	Min.	2.8 (0.08)	Aug. 10, 1980
Monthly:	Max.	4,350 (123)	June 1960	Min.	102 (2.89)	March 1957
Yearly:	Max.	1,830 (51.7)	1982	Min.	880 (24.9)	1970

## Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	222	316	623	1,600	2,570	2,250	3,340	465	1,810	471	1,100	1,270
2	143	320	494	1,630	2,270	2,100	3,500	435	1,880	468	1,630	993
3	68.9	316	557	1,410	2,530	2,110	3,480	881	1,920	458	1,740	927
4	72.8	420	790	1,110	3,070	1,700	3,300	1,100	1,740	388	1,820	688
5	316	488	844	993	2,380	1,560	3,040	1,150	1,060	719	1,800	562
6	320	378	860	1,300	1,910	1,090	3,710	1,130	963	1,150	1,750	644
7	506	260	615	1,470	1,480	714	4,080	1,060	1,370	1,160	1,160	957
8	518	270	606	1,230	1,320	534	3,930	989	1,670	1,170	1,150	1,180
9	309	704	1,000	1,100	871	657	3,780	999	1,550	1,170	1,010	1,210
10	190	832	1,070	873	860	703	3,620	1,770	1,490	832	1,040	1,170
11	208	759	984	597	683	642	3,110	2,130	1,370	971	923	906
12	391	706	732	622	558	520	2,560	2,230	1,260	1,500	990	650
13	373	824	736	970	530	163	3,420	2,090	1,240	1,530	881	611
14	373	602	258	968	576	80.7	3,520	1,820	1,980	1,640	637	920
15	378	752	197	1,250	557	148	3,240	1,660	2,540	1,630	393	1,160
16	333	1,430	270	1,350	327	313	2,980	1,390	2,390	1,440	536	1,160
17	125	1,600	308	1,380	306	261	3,040	2,460	2,400	1,360	736	1,000
18	161	1,640	592	1,160	753	262	2,540	2,710	2,300	1,280	708	748
19	182	1,530	836	856	1,050	393	1,930	2,550	1,800	1,550	717	438
20	267	1,480	831	1,840	1,140	159	2,430	2,220	1,580	1,700	1,010	604
21	303	1,160	622	2,090	1,260	136	2,450	2,170	1,860	1,920	720	837
22	366	966	765	2,160	1,190	297	2,360	1,880	1,450	1,820	778	867
23	183	884	1,100	2,300	1,080	433	2,310	1,660	1,270	1,380	1,190	858
24	131	837	1,190	2,020	1,200	788	2,260	2,320	1,310	972	1,200	388
25	97.4	760	1,230	1,690	1,610	1,020	1,870	2,510	1,220	905	1,080	174
26	252	625	1,010	1,900	1,940	997	1,280	2,490	907	1,350	622	189
27	286	706	1,020	2,350	2,300	1,290	1,420	2,240	930	1,440	897	331
28	270	554	751	2,480	2,410	1,520	1,280	1,870	684	1,450	588	1,220
29	362			2,500	2,390	2,780	1,240	1,440	415	1,540	558	1,570
30	380			1,030	2,530	2,570	3,240	781	1,470	451	1,360	1,010
31	334			1,090	2,610	620	1,840	53,538	1,060			1,200
<b>Sum</b>	22,119	45,729	46,301	28,770.7	53,129		37,784					26,992
	8,421.1	23,805	46,301	82,421	44,810		30,374					

## Current Year 1987

Month	Average Rainfall Inches**		Extreme Second-Feet		Average Second- Feet	Total Acre-Feet	Acre-Feet		
	1987	1954-1987	Day	Day			Average	Maximum	Minimum
Jan.	2.26	1.48	8	518	3	68.9	272	16,703	72,096
Feb.	2.17	1.46	18	1,640	7	260	790	43,872	126,230
Mar.	.64	.67	25	1,230	15	197	768	47,217	71,031
Apr.	1.01	1.52	30	2,530	11	597	1,520	90,702	110,071
May	3.52	2.81	4	3,070	17	306	1,490	91,837	114,833
June	4.95	2.89	30	3,240	14	80.7	959	57,066	130,027
July	2.29	1.74	7	4,080	31	620	2,660	163,480	196,205
Aug.	1.30	2.45	18	2,710	2	435	1,710	105,380	143,286
Sept.	3.47	4.47	15	2,540	29	415	1,490	88,879	58,991
Oct.	.79	2.68	21	1,920	4	388	1,220	74,943	61,667
Nov.	1.66	1.27	4	1,820	15	393	1,010	60,246	50,240
Dec.	.50	1.18	29	1,570	25	174	871	53,538	48,962
	24.56	24.62		4,080		68.9	1,230	893,863	955,284
								1,322,498	636,835
Yearly		Cubic Meters per Second		Thousands of Cubic Meters					
		Millimeters							
	624	625	116	1.95	34.8	1,102,562	1,178,324	1,631,275	785,523

\*\* United States side - average of several stations in the reach

Mean daily

## OUTFALLS FROM SEWERS INTO THE RIO GRANDE

IN ACRE-FEET

## EL PASO SEWAGE OUTFALL

Treated sewage effluent enters the Rio Grande through the outfall of the Haskell Street Wastewater Treatment Plant located 7.1 river miles downstream from the American Dam. The outfall from this plant consists of flows measured by a Sparling propeller meter and estimates of amounts which bypass the meter. The records are furnished by the City of El Paso, Texas.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1987	1,690	1,657	1,675	1,628	1,456	1,647	1,793	1,824	1,702	1,729	1,571	1,635	20,007
* Average	2,040	1,923	2,032	2,004	2,126	2,142	2,269	2,309	2,243	2,155	2,028	2,040	25,311

## EAGLE PASS SEWAGE OUTFALL

Treated sewage effluent enters the Rio Grande at river mile 495.8 and about 600 feet upstream from the Eagle Pass-Piedras Negras International Railroad Bridge. The records are based on weekly current meter measurements and estimates by personnel of the International Boundary and Water Commission.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1987	181	170	164	150	169	217	145	136	147	163	134	140	1,916
* Average	178	152	171	168	184	182	187	182	180	195	174	182	2,135

## LAREDO SEWAGE OUTFALL

Treated sewage effluent enters the Rio Grande from two sewage treatment plants, Zacate Creek Sewage Treatment Plant and Southside Sewage Treatment Plant. These sewage outfalls enter the Rio Grande at river miles 360.0 and 356.0, 0.9 and 4.9 river miles respectively downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas. The record is furnished by the Laredo Water Treatment Plant in Laredo, Texas.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1987	861	799	896	869	924	896	958	990	944	947	923	703	10,710
* Average	817	732	807	797	893	869	901	914	927	927	860	831	10,275

## NUEVO LAREDO SEWAGE OUTFALL

Sewage from Nuevo Laredo is discharged directly to the Rio Grande through 14 known drains. Two of the larger drains, Mina and Coahuila, for which data have been provided below, enter the Rio Grande at river miles 353.7 and 357.7, 2.2 and 3.2 river miles respectively downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas. The records below are furnished by the Mexican Section of the International Boundary and Water Commission. The records were based on current meter measurements and a continuous record of gage heights through 1985. In 1986 through 1987 they were based on periodic staff gage readings and estimates of flow.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1987	718	802	773	289	725	576	409	370	327	433	508	432	6,362
* Average	768	720	727	555	697	634	618	652	557	647	644	668	7,887

## BROWNSVILLE SEWAGE OUTFALL

Treated sewage effluent enters the Rio Grande at river mile 46.8, 8.9 river miles downstream from the Gateway Bridge between Brownsville, Texas and Matamoros, Tamaulipas and 1.9 river miles downstream from the Brownsville Gaging station. Records are furnished by the City of Brownsville.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1987	584	570	579	529	585	580	555	543	551	582	580	581	6,819
* Average	664	602	650	626	688	674	697	685	721	708	636	641	7,992

\* Period averages are for past 10 years

## MUNICIPAL AND INDUSTRIAL WATER USES

**IN ACRE-FEET**

Tabulated below are monthly and yearly amounts of water pumped from the Rio Grande directly into municipal distribution systems of cities along the border, except for the city of Del Rio, whose main supply is derived from San Felipe Springs; and the city of El Paso, whose supply is derived mainly from deep wells. The amount shown below for the city of El Paso is Rio Grande water pumped from the Franklin Canal at the El Paso Water Plant for municipal use. Ciudad Acuna, Coahuila, whose municipal diversion from the Rio Grande started in 1971, may at times use an alternate source from Arroyo Las Vacas, which was its previous source of supply. Such use would be reflected in the tabulations below.

All Rio Grande water used by U. S. municipalities below Falcon Dam is also included in the figures shown under "Diversion from the Rio Grande - United States Side..." (by river reaches and total below Falcon Dam) on pages 63, 66, 70, 71, 73, 75, and 76 herein. Population data was provided by the Chamber of Commerce for each city in the United States, except El Paso, which was provided by the City Planning Office; Falcon Village, estimated by the International Boundary and Water Commission; Del Rio, by the Middle Rio Grande Development Counsel; Laughlin Air Force Base, by Laughlin Air Force; Laredo, by the Laredo Development Foundation; and Rio Bravo and San Ygnacio, which are based on utilities connections.

IN THE UNITED STATES

Month	EL PASO (Pop. 511,231)			DEL RIO (Pop. 39,814)		
	1987	Period 1978-1987		1987	Period 1978-1987	
		Average	Maximum		Average	Maximum
Jan.	0	59.0	337	0	718	547
Feb.	335	156	477	0	609	535
Mar.	427	535	1,256	0	755	753
Apr.	1,469	1,529	2,723	0	852	850
May	3,310	3,009	3,905	0	812	839
June	3,745	3,533	4,216	2,099	896	942
July	4,409	3,739	4,409	2,200	1,143	1,241
Aug.	4,095	3,489	4,272	2,067	1,759	1,280
Sept.	3,654	2,877	4,251	863	1,156	906
Oct.	935	458	1,794	0	1,113	718
Nov.	0	88.9	334	0	861	583
Dec.	0	49.0	329	0	757	560
Yearly	22,379	19,522	25,588	7,229	11,431	9,754
					11,441	7,565

Month	EAGLE PASS (Pop. 37,400)			LAREDO (Pop. 118,681)		
	1987	Period 1978-1987		1987	Period 1978-1987	
		Average	Maximum		Average	Maximum
Jan.	191	254	297	191	1,377	1,367
Feb.	195	248	294	195	1,304	1,266
Mar.	251	313	395	251	1,638	1,643
Apr.	268	337	408	268	1,741	1,766
May	248	331	390	248	1,725	1,812
June	245	361	433	245	1,784	1,923
July	326	467	582	326	2,343	2,325
Aug.	428	467	564	372	2,591	2,356
Sept.	317	402	545	270	1,940	1,928
Oct.	300	345	507	217	1,839	1,730
Nov.	252	279	345	196	1,767	1,558
Dec.	245	256	297	189	1,592	1,471
Yearly	3,266	4,059	4,611	3,171	21,641	21,145
					22,596	18,752

Month	LAREDO POWER STATION			RIO BRAVO			(Pop. 2,750)	
	1987	Period 1978-1987			1987	Period 1984-1987		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	30.0	69.1	134	30.0	29.0	13.9	29.0	4.5
Feb.	70.0	74.5	123	39.7	8.6	6.6	13.4	0
Mar.	88.6	88.2	181	44.8	.8	10.3	21.0	.8
Apr.	116	96.5	133	54.4	20.0	13.5	20.0	4.3
May	132	110	159	73.4	26.3	15.0	26.3	5.5
June	128	133	170	80.4	17.2	11.6	17.2	8.5
July	149	146	178	101	16.1	10.4	16.1	4.7
Aug.	147	146	176	111	25.6	21.7	28.7	11.0
Sept.	123	117	148	75.6	23.3	19.8	24.4	9.9
Oct.	99.0	100	216	61.4	29.7	19.3	29.7	6.0
Nov.	101	66.0	101	30.3	25.4	16.6	25.4	3.3
Dec.	50.4	54.0	98.3	6.6	24.3	8.5	24.3	0
Yearly	1,234	1,200	1,686	776	246	167	246	92.4



**MUNICIPAL AND INDUSTRIAL WATER USES**  
IN ACRE-FEET

IN MEXICO

Month	CD. ACUNA, COAHUILA				PIEDRAS NEGRAS, COAHUILA			
	1987	Period 1978-1987			1987	Period 1978-1987		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	243.0	223.3	251.2	198.1	645.0	500.1	646.7	318.2
Feb.	227.0	211.0	228.5	198.8	555.0	444.2	600.0	279.4
Mar.	213.0	228.0	247.6	210.5	632.0	507.4	654.1	359.1
Apr.	244.0	216.8	244.0	176.2	620.0	493.0	681.6	297.2
May	243.9	224.7	251.2	196.8	660.5	518.8	704.4	295.2
June	244.0	226.8	244.0	209.6	683.3	519.8	722.3	285.1
July	239.2	237.9	278.0	219.5	755.3	572.0	792.1	301.7
Aug.	244.6	239.2	279.0	220.8	737.8	627.6	854.2	348.0
Sept.	243.0	232.3	270.0	215.1	696.0	588.5	774.1	321.3
Oct.	250.0	232.6	251.2	222.1	708.0	569.4	737.4	370.7
Nov.	237.0	220.4	246.6	175.3	632.0	505.9	681.2	351.3
Dec.	251.0	227.5	254.9	170.4	645.0	509.8	675.2	361.3
Yearly	2,909.7	2,720.5	2,936.2	2,560.6	7,969.9	6,356.5	8,260.7	4,391.2

Month	NUEVO LAREDO, TAMPS.				NUEVA CD. GUERRERO, TAMPS.			
	1987	Period 1978-1987			1987	Period 1978-1987		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	2,713.0	2,148.2	2,713.0	1,663.7	54.7	44.2	59.3	34.0
Feb.	2,449.0	1,974.1	2,581.4	1,516.6	53.8	41.3	53.8	29.3
Mar.	2,713.0	2,303.7	2,913.0	1,883.9	59.6	43.7	59.6	33.5
Apr.	2,864.0	2,359.3	2,864.0	1,999.0	34.9	46.1	60.0	34.5
May	2,912.7	2,523.5	2,912.7	2,084.2	58.4	46.6	58.4	34.9
June	2,854.3	2,530.2	2,932.5	2,112.8	57.2	49.4	76.4	33.6
July	2,941.5	2,671.9	2,941.5	2,204.8	58.4	46.1	59.0	36.8
Aug.	2,949.5	2,709.3	2,949.5	2,308.7	55.5	44.0	55.5	35.8
Sept.	2,875.0	2,530.8	2,875.0	2,100.8	56.4	41.7	56.4	33.5
Oct.	2,954.0	2,541.7	2,954.0	2,095.2	53.2	45.1	54.8	33.4
Nov.	2,849.0	2,462.2	2,850.0	2,062.8	48.9	44.4	56.7	32.8
Dec.	2,627.0	2,361.3	2,800.1	1,991.5	49.7	44.8	58.5	33.1
Yearly	33,702.0	29,116.2	33,702.0	24,463.9	640.7	537.4	640.7	458.6

Month	CD. MIER, TAMPS.				CD. MIGUEL ALEMAN, TAMPS.			
	1987	Period 1978-1987			1987	Period 1978-1987		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	31.4	43.4	55.5	31.4	114.0	61.7	114.0	36.8
Feb.	29.7	35.9	57.1	11.2	108.0	65.6	109.3	35.3
Mar.	35.9	49.2	76.5	28.7	118.0	79.8	119.4	42.4
Apr.	38.2	48.0	61.0	35.3	126.0	77.5	126.0	41.5
May	33.0	49.0	59.7	33.0	130.3	83.3	130.3	42.0
June	34.1	44.6	59.3	34.1	129.6	86.5	129.6	48.5
July	39.0	46.3	64.5	30.8	133.2	87.6	133.2	47.2
Aug.	39.9	50.3	63.2	33.2	136.8	88.6	136.8	49.2
Sept.	43.0	44.2	58.5	33.0	131.0	84.6	131.0	47.4
Oct.	43.5	52.9	101.3	35.0	128.0	81.5	128.0	43.7
Nov.	37.9	45.4	60.4	30.3	127.0	79.8	127.0	46.2
Dec.	40.3	42.7	57.2	35.4	128.0	73.3	128.0	38.4
Yearly	445.9	551.9	704.4	412.9	1,509.9	949.8	1,509.9	544.5

## STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

IN THOUSANDS OF ACRE-FEET

Data are presented below for all storage reservoirs in the Rio Grande basin in the United States and Mexico that exceed 15,000 acre-feet in capacity. The monthly figures represent the water in storage on the last day of each month, in thousands of acre-feet. The capacities indicated are at spillway level. Storage figures greater than the capacity indicate that the water surface was above spillway level. Monthly storage data for Rosetilla Reservoir is available from 1936 through 1986.

The reservoirs and the agencies providing the data are: Rio Grande, Continental, Santa Maria, Terrace, Mountain Home, and Sanchez from the State of Colorado, Division of Water Resources; Abiquiu, Cochiti, and Santa Rosa from the United States Corps of Engineers; Costilla from the New Mexico Interstate Stream Commission; Bluewater, Lake Sumner, McMillan, and Avalon from the United States Geological Survey; Platoro, Heron, El Vado, Elephant Butte, and Caballo from the United States Bureau of Reclamation; Storrie from the State Engineer Office of New Mexico; Red Bluff from the Red Bluff Water Power Control District; Delta from the Delta Lake Irrigation District; La Boquilla, and La Colina from the Federal Power Commission of Mexico; Francisco I. Madero, Chihuahua, Luis L. Leon, Centenario, San Miguel, Venustiano Carranza, Laguna de Salinillas, Rodrigo Gomez (La Boca), Marte R. Gomez, Culebron, Villa Cardenas, and Palito Blanco from the Ministry of Agriculture and Hydraulic Resources of Mexico; Lake Casa Blanca, Amistad Reservoir (International) and Falcon Reservoir (International) from the International Boundary and Water Commission.

## IN THE UNITED STATES

Month	RIO GRANDE (Capacity 51.1)		CONTINENTAL (Capacity 22.7)		SANTA MARIA (Capacity 45.1)		TERRACE (Capacity 17.2)		MOUNTAIN HOME (Capacity 18.6)	
	1987	Average 1927-1987	1987	Average 1928-1987	1987	Average 1928-1987	1987	Average 1925-1987	1987	Average 1924-1987
JAN.	0	14.6	9.3	4.9	26.4	7.7	12.1	4.2	6.8	3.7
FEB.	0	15.7	10.3	5.3	25.8	8.2	12.9	4.6	7.0	4.0
MAR.	3.5	17.1	11.0	5.8	25.1	8.8	12.0	5.0	7.5	4.4
APR.	8.0	17.8	12.8	6.3	24.5	10.0	9.7	5.8	8.1	4.9
MAY	4.2	22.2	11.7	8.0	30.4	13.2	9.1	7.2	10.5	6.5
JUNE	43.6	24.0	14.1	8.4	32.0	14.8	13.2	8.5	11.6	6.9
JULY	14.9	14.1	13.1	5.9	26.7	10.6	5.9	5.9	6.6	5.1
AUG.	.7	8.1	13.8	4.1	17.0	6.6	4.0	3.8	2.8	3.1
SEP.	.5	8.4	10.3	3.9	13.6	6.3	3.5	3.4	2.6	2.8
OCT.	3.0	9.2	9.1	3.8	13.2	6.5	3.3	3.5	2.4	2.8
NOV.	5.0	11.5	9.9	4.1	13.3	7.1	3.6	3.6	2.8	3.1
DEC.	6.2	13.2	10.5	4.6	13.4	7.5	4.0	4.0	3.0	3.4
AVG.	7.5	14.7	11.3	5.4	21.8	8.9	7.8	5.0	6.0	4.2
MAX.	43.6	54.8	14.1	26.7	32.0	42.1	13.2	17.7	11.6	16.4
MIN.	0	0	9.1	0	13.2	0	3.3	0	2.4	0

Month	SANCHEZ (Capacity 103.2)		PLATORO (Capacity 60.0)		COSTILLA (Capacity 15.7)		HERON (Capacity 401.3)		EL VADO (Capacity 186.3)	
	1987	Average 1927-1987	1987	Average 1952-1987	1987	Average 1922-1987	1987	Average 1971-1987	1987	Average 1935-1987
JAN.	42.3	13.1	49.0	12.2	9.9	4.6	368.0	213.1	167.5	51.3
FEB.	42.3	13.2	47.7	12.0	10.2	5.0	355.9	209.6	167.3	49.5
MAR.	42.5	13.8	47.2	12.2	10.6	5.5	346.3	206.1	167.2	50.6
APR.	45.6	15.0	40.4	12.2	11.0	6.6	337.0	211.8	166.7	81.6
MAY	53.4	18.5	47.0	14.1	11.6	8.4	360.0	242.3	164.6	117.3
JUNE	61.1	18.7	37.5	20.4	13.0	7.9	400.0	270.8	171.8	110.6
JULY	52.3	14.6	53.5	19.7	7.3	5.3	398.6	274.3	168.6	94.9
AUG.	49.1	12.3	44.4	18.3	4.1	3.6	397.4	273.0	160.6	76.7
SEP.	47.9	12.4	44.0	18.5	3.2	3.1	395.3	270.5	138.6	65.5
OCT.	45.6	12.9	44.0	18.3	3.8	3.5	393.5	270.2	129.4	61.4
NOV.	44.9	13.0	43.8	14.5	4.3	3.9	393.4	268.7	127.8	53.1
DEC.	44.5	13.5	43.6	14.4	4.4	4.2	393.0	240.3	122.3	52.8
AVG.	47.6	14.3	45.2	15.6	7.8	5.1	378.2	245.9	154.4	72.1
MAX.	61.1	62.4	53.5	55.3	13.0	15.1	400.0	401.3	171.8	203.5
MIN.	42.3	0	37.5	0	3.2	0	337.0	.6	122.3	0

## STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

IN THOUSANDS OF ACRE-FEET

## IN THE UNITED STATES

Month	ABIQUIU (Capacity 1,212.0)		COCHITI (Capacity 505.7)		BLUEWATER (Capacity 43.5)		ELEPHANT BUTTE (Capacity 2,110.3)		CABALLO (Capacity 331.5)	
	1987	Average 1965-1987	1987	Average 1973-1987	1987	Average 1927-1987	1987	Average 1915-1987	1987	Average 1938-1987
JAN.	354.2	52.3	52.0	51.4	15.1	8.7	2,045.9	791.9	248.5	99.3
FEB.	293.2	48.6	52.8	47.3	16.3	9.3	2,082.4	795.9	254.5	123.6
MAR.	237.6	46.1	91.0	49.0	24.3	13.2	2,087.1	779.1	234.8	102.3
APR.	276.8	54.7	226.4	63.9	33.1	16.8	2,063.0	772.9	230.3	100.8
MAY	391.9	101.7	374.7	96.5	31.6	15.2	2,069.2	859.0	233.2	106.9
JUNE	400.3	97.5	382.0	111.0	28.6	12.8	2,052.1	889.0	246.4	94.4
JULY	362.3	84.4	172.6	78.2	24.6	11.3	2,065.6	837.9	233.8	76.5
AUG.	311.9	80.5	180.7	66.0	22.0	10.1	2,017.8	784.7	245.5	51.5
SEP.	263.3	77.5	217.1	65.5	20.1	9.6	1,961.0	761.2	237.7	39.8
OCT.	199.8	74.6	259.7	69.8	19.5	9.2	1,957.5	762.7	210.9	51.4
NOV.	170.1	65.4	273.4	68.9	19.4	9.0	1,995.2	782.1	209.4	64.3
DEC.	177.2	63.0	252.4	68.1	19.1	8.8	2,043.4	803.3	215.3	81.3
AVG.	286.6	70.5	211.2	69.6	22.8	11.2	2,036.7	801.6	232.9	82.7
MAX.	400.3	400.3	382.0	382.0	33.1	47.1	2,095.6	2,302.8	262.6	346.6
MIN.	170.1	0	52.0	3.6	15.1	0	1,954.6	3.3	209.4	0

Month	STORRIE (Capacity 23.3)		SANTA ROSA (Capacity 447.1)		LAKE SUMNER (Capacity 101.6)		McMILLAN & AVALON (Capacity 37.4)		RED BLUFF (Capacity 310.0)	
	1987	Average 1939-1987	1987	Average 1980-1987	1987	Average 1937-1987	1987	Average 1908-1987	1987	Average 1936-1987
JAN.	19.2	7.7	106.7	40.7	66.4	61.5	22.9	25.9	259.2	94.6
FEB.	20.3	7.7	107.7	41.1	67.1	65.5	22.8	26.1	268.5	96.5
MAR.	22.6	8.5	106.5	42.9	64.8	55.7	23.0	25.5	281.7	93.9
APR.	22.6	9.0	113.6	49.1	54.3	48.3	33.4	17.4	274.8	82.6
MAY	22.9	9.5	116.3	55.7	51.1	48.9	34.2	19.2	262.1	84.0
JUNE	21.7	8.3	112.3	61.6	51.4	43.8	30.7	18.6	248.8	86.0
JULY	19.2	8.3	110.6	50.1	47.8	41.9	15.4	17.6	233.4	77.7
AUG.	20.3	8.9	111.7	52.6	43.6	45.1	9.6	16.5	229.6	74.4
SEP.	20.9	8.3	111.6	50.7	36.8	47.0	18.4	18.0	225.0	78.1
OCT.	20.3	8.0	111.4	52.9	27.4	49.7	12.7	19.8	217.7	86.2
NOV.	19.8	8.1	111.8	53.4	32.6	52.8	18.9	21.5	217.6	89.4
DEC.	18.8	7.6	111.7	54.0	38.2	57.4	24.3	24.4	221.1	93.7
AVG.	20.7	8.3	111.0	50.4	48.5	51.5	22.2	20.9	245.0	86.4
MAX.	22.9	26.3	116.3	116.3	67.1	156.3	34.2	85.5	281.7	327.5
MIN.	18.8	0	106.5	0	27.4	.4	9.6	0	217.6	10.0

Month	LAKE CASA BLANCA (Capacity 19.1)		DELTA LAKE (Capacity 25.0)						TOTAL IN U.S. RESERVOIRS (Capacity 6,087.7)	
	1987	Average 1962-1987	1987	Average 1939-1987					1987	ESTIMATED AVERAGE
JAN.	13.5	13.1	12.8	15.4					3,907.7	1,591.9
FEB.	13.2	12.9	18.4	14.9					3,897.6	1,616.5
MAR.	13.9	12.8	17.3	14.1					3,877.5	1,572.4
APR.	13.6	13.0	14.8	14.3					4,020.5	1,614.8
MAY	12.7	13.8	13.6	15.1					4,316.0	1,883.2
JUNE	13.1	14.0	13.2	14.9					4,398.5	1,942.9
JULY	13.7	13.4	19.3	14.8					4,065.8	1,762.5
AUG.	13.1	13.5	18.6	14.0					3,918.3	1,627.4
SEP.	13.9	14.5	19.3	15.2					3,799.6	1,580.2
OCT.	14.1	14.2	18.8	15.4					3,717.1	1,606.0
NOV.	12.5	13.8	15.2	15.2					3,744.7	1,626.5
DEC.	11.8	13.6	15.0	14.8					3,793.2	1,647.9
AVG.	13.3	13.6	16.4	14.8					3,954.7	1,672.7
MAX.	14.1	28.2	19.3	22.6					4,398.5	
MIN.	11.8	3.5	12.8	0					3,717.1	

0 Daily extremes

! Totals of period averages in all reservoirs

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN  
IN THOUSANDS OF ACRE-FEET

## IN MEXICO

Month	LA BOQUILLA (Capacity 2,417.5)		LA COLINA (Capacity 19.5)		*** ROSETILLA		FRANCISCO I. MADERO (Capacity 282.1)		CHIHUAHUA (Capacity 25.9)	
	1987	Average 1914-1987	1987	Average 1940-1987	1987	Average 1940-1986	1987	Average 1948-1987	1987	Average 1961-1987
Jan.	1,949.7	1,503.8	20.2	18.2		12.8	268.8	220.2	6.0	7.9
Feb.	1,844.1	1,465.6	20.1	18.6		12.7	263.9	216.0	5.5	7.6
Mar.	1,713.5	1,409.5	20.3	18.7		12.1	246.7	201.7	5.0	7.2
Apr.	1,623.1	1,333.0	19.8	19.1		11.9	235.2	169.2	4.7	6.8
May	1,539.2	1,261.5	20.2	18.8		11.9	212.7	140.4	4.5	6.1
June	1,440.7	1,182.5	20.3	18.9		12.2	186.9	124.7	4.3	5.8
July	1,454.1	1,219.7	19.9	18.9		12.2	197.5	140.0	3.8	5.9
Aug.	1,662.4	1,389.3	20.1	18.7		13.0	217.1	173.6	4.3	7.2
Sep.	1,693.3	1,564.1	19.7	18.4		13.2	199.8	212.5	4.5	9.3
Oct.	1,651.8	1,573.1	19.7	18.3		13.2	193.1	219.6	4.2	9.1
Nov.	1,638.0	1,541.5	19.7	16.7		12.6	195.5	220.3	3.9	8.8
Dec.	1,627.3	1,529.4	19.7	18.4		13.0	197.1	219.2	3.7	8.3
Avg.	1,653.1	1,414.4	20.0	18.5		12.6	217.9	188.1	4.5	7.5
Max.	1,949.7	2,758.1	20.3	22.5		19.4	268.8	366.6	6.0	26.5
Min.	1,440.7	16.9	19.7	11.6		0	186.9	1.5	3.7	.2

Month	LUIS L. LEON (Capacity 689.1)		CENTENARIO and SAN MIGUEL (Capacity 19.9)		VENUSTIANO CARRANZA (Capacity 1,122.8)		LAGUNA DE SALINILLAS (Capacity 15.4)		RODRIGO GOMEZ (Capacity 33.2)	
	1987	Average 1968-1987	1987	Average 1934-1987	1987	Average 1930-1987	1987	Average 1931-1987	1987	Average 1963-1987
Jan.	368.1	392.6	20.5	13.8	715.6	479.6	6.6	7.5	21.5	27.5
Feb.	366.4	387.7	20.6	13.6	749.7	460.1	8.6	9.1	21.2	27.3
Mar.	315.4	362.5	20.6	10.8	732.9	434.7	9.6	7.5	20.0	26.6
Apr.	308.9	332.8	19.5	9.2	727.8	422.0	10.8	8.8	18.7	25.5
May	295.9	308.2	19.9	9.8	771.6	405.1	5.9	8.8	19.5	25.2
June	293.5	306.6	20.7	8.4	849.5	388.7	7.9	8.0	19.9	25.1
July	317.0	317.7	20.2	7.9	964.7	395.9	10.5	7.6	17.2	24.8
Aug.	290.2	321.7	19.3	8.5	963.6	404.7	8.9	7.7	15.5	25.0
Sep.	315.4	373.8	18.7	10.5	1,050.1	457.6	7.0	8.3	19.5	27.5
Oct.	316.2	397.4	17.7	12.5	1,087.7	493.4	4.9	7.8	19.7	28.4
Nov.	341.3	404.6	16.1	12.9	1,094.1	502.5	10.9	7.4	17.8	28.1
Dec.	348.6	412.8	14.8	13.2	1,075.0	500.2	9.7	7.1	14.8	27.6
Avg.	323.1	359.9	19.1	10.9	898.5	445.7	8.4	8.0	18.8	26.6
Max.	368.1	753.1	20.7	20.7	1,094.1	1,167.8	10.9	15.6	21.5	36.8
Min.	290.2	3.8	14.8	0	715.6	1.0	4.9	0	14.8	0

Month	MARTE R. GOMEZ (Capacity 889.3)		CULEBRON and VILLA CARDENAS (Capacity 90.0)		PALITO BLANCO (Capacity 124.0)				TOTAL IN MEXICAN RESERVOIRS (Capacity 5,728.7)	
	1987	Average 1943-1987	1987	Average 1939-1987	1987	Average 1942-1987			1987	ESTIMATED AVERAGE
Jan.	787.8	619.6	0	26.6	0	27.7			4,164.8	3,345.0
Feb.	803.3	580.0	0	24.5	0	24.0			4,103.4	3,234.1
Mar.	805.8	553.7	0	22.9	0	23.8			3,889.8	3,079.6
Apr.	735.2	510.4	0	24.1	0	22.0			3,703.7	2,882.9
May	694.9	473.5	0	25.6	0	22.1			3,584.3	2,705.1
June	802.0	483.5	0	27.1	0	24.0			3,645.7	2,603.3
July	772.4	474.4	0	23.8	0	23.1			3,777.3	2,663.3
Aug.	750.6	508.8	0	25.7	0	21.4			3,952.0	2,912.3
Sep.	913.7	631.0	0	31.5	0	30.3			4,241.7	3,374.8
Oct.	899.3	669.4	0	32.7	0	33.5			4,214.3	3,495.1
Nov.	889.3	671.6	0	27.5	0	32.1			4,226.6	3,474.0
Dec.	877.8	668.9	0	30.4	0	30.9			4,188.5	3,466.4
Avg.	811.0	570.4	0	26.9	0	26.2			3,971.3	3,103.0
Max.	913.7	1,465.4	0	116.8	0	140.1			4,241.7	
Min.	694.9	** 17.8	0	0	0	0			3,584.3	

\* Minimum since full reservoir in 1932

\*\* Minimum since full reservoir in 1947

\*\*\* No data

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN  
INTERNATIONAL AMISTAD RESERVOIR

Amistad Dam is the second of the major international storage dams constructed on the Rio Grande as authorized by the Water Treaty of 1944 between the United States and Mexico. It is located at river mile 573.9, 12.9 river miles upstream from Del Rio, Texas and Cd. Acuna, Coahuila.

Maximum storage for period of record: 4,859,900 acre-feet on September 22, 1974 with an elevation of 1,135.66 feet above mean sea level, U. S. C. & G. S. datum. The elevation-area-capacity table, based on the 1980 survey, became effective November 1, 1981.

## STORAGE CAPACITIES

(1980 Survey)

Elevation	Description	At Indicated Elevation		Between Indicated Elevations	
		Reservoir Capacity Acre-Feet	Reservoir Area Acres	Storage Volume Acre-Feet	Type of Storage
898.0	Original River Bed at Dam Axis	0	0	0	
930.0	Lowest Outlet (United States Penstocks)	0	0	3,383,848	Silt & Conservation
1,117.0	Top of Conservation Storage *	3,383,848	64,860	1,744,152	Ordinary Flood
1,140.4	Top of Spillway Gates	5,128,000	84,358	336,000	Surcharge
1,144.3	Maximum Water Surface	5,464,000	88,127		

## STORAGE IN THOUSANDS OF ACRE-FEET AT 24:00 HOURS 1987 - ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,905.4	2,935.4	2,950.0	2,966.6	3,077.5	3,266.7	3,424.1	3,439.2	3,441.4	3,425.2	3,441.4	3,458.6
2	2,910.2	2,935.3	2,949.0	2,968.6	3,081.6	3,280.2	3,420.9	3,438.1	3,440.3	3,430.6	3,441.4	3,460.8
3	2,915.1	2,934.5	2,950.0	2,968.6	3,088.6	3,293.8	3,417.7	3,438.1	3,439.4	3,431.7	3,441.4	3,465.1
4	2,918.0	2,933.5	2,951.0	2,968.6	3,092.6	3,302.2	3,412.4	3,439.2	3,430.6	3,433.8	3,443.5	3,467.3
5	2,920.9	2,948.1	2,952.0	2,972.5	3,092.4	3,335.6	3,408.1	3,439.2	3,426.3	3,434.9	3,443.5	3,469.4
6	2,926.7	2,948.1	2,952.9	2,976.4	3,100.6	3,352.7	3,403.8	3,439.2	3,424.1	3,432.8	3,441.4	3,471.6
7	2,931.6	2,947.1	2,952.9	2,980.3	3,102.7	3,363.4	3,403.8	3,438.1	3,420.9	3,429.5	3,441.4	3,472.7
8	2,935.4	2,948.1	2,952.9	2,984.3	3,105.7	3,375.0	3,403.8	3,437.0	3,418.8	3,426.3	3,447.8	
9	2,939.3	2,947.1	2,955.9	2,987.2	3,109.7	3,383.5	3,404.9	3,436.0	3,416.6	3,423.1	3,445.7	3,477.0
10	2,944.2	2,947.1	2,958.8	2,989.2	3,112.8	3,389.9	3,404.9	3,434.9	3,415.6	3,422.0	3,442.4	3,480.3
11	2,947.1	2,947.1	2,958.8	2,991.1	3,118.8	3,400.6	3,405.9	3,434.9	3,412.4	3,419.8	3,439.2	3,482.4
12	2,951.0	2,947.1	2,959.8	2,992.2	3,122.9	3,408.1	3,409.1	3,434.9	3,411.3	3,416.8	3,439.2	3,485.7
13	2,953.9	2,946.1	2,960.8	2,990.2	3,127.9	3,416.6	3,411.3	3,433.8	3,409.1	3,422.0	3,437.0	3,487.8
14	2,958.8	2,946.1	2,962.7	2,991.2	3,134.0	3,424.1	3,415.6	3,431.7	3,408.1	3,420.9	3,436.0	3,492.2
15	2,962.7	2,946.1	2,963.7	2,993.1	3,142.2	3,428.5	3,418.8	3,430.6	3,410.2	3,416.6	3,434.9	3,490.0
16	2,961.8	2,946.1	2,972.5	2,996.1	3,146.2	3,430.6	3,426.3	3,427.4	3,412.4	3,416.6	3,430.6	3,491.1
17	2,962.7	2,945.1	2,972.5	3,000.0	3,158.4	3,433.8	3,428.1	3,424.1	3,411.5	3,416.6	3,429.5	3,492.2
18	2,957.8	2,944.2	2,972.5	3,002.0	3,166.6	3,431.7	3,429.2	3,422.0	3,417.7	3,417.7	3,430.6	3,494.4
19	2,954.9	2,944.2	2,972.5	3,004.9	3,171.7	3,430.6	3,422.4	3,419.8	3,415.6	3,419.8	3,431.7	3,500.9
20	2,954.9	2,946.1	2,974.5	3,011.9	3,179.9	3,428.5	3,441.4	3,417.7	3,422.0	3,432.8	3,432.8	3,504.2
21	2,952.9	2,944.2	2,974.5	3,021.8	3,184.0	3,433.8	3,442.4	3,444.5	3,419.8	3,422.0	3,433.8	3,506.4
22	2,951.0	2,943.2	2,975.4	3,023.7	3,187.1	3,430.6	3,444.6	3,440.2	3,417.7	3,424.1	3,437.0	3,509.6
23	2,949.0	2,946.1	2,974.5	3,027.7	3,189.1	3,430.6	3,443.5	3,407.0	3,417.7	3,426.3	3,439.2	3,512.9
24	2,949.0	2,946.1	2,974.5	3,034.6	3,212.8	3,430.6	3,444.6	3,405.9	3,416.6	3,428.5	3,443.5	3,516.2
25	2,947.1	2,947.1	2,973.5	3,042.6	3,222.1	3,429.5	3,444.6	3,409.1	3,414.5	3,431.7	3,445.3	3,518.4
26	2,943.2	2,948.1	2,973.5	3,048.6	3,227.2	3,428.5	3,444.6	3,411.3	3,414.5	3,434.9	3,448.9	3,516.2
27	2,943.2	2,952.9	2,972.5	3,054.6	3,234.5	3,421.1	3,445.7	3,417.7	3,415.6	3,426.0	3,450.0	3,515.1
28	2,941.3	2,950.0	2,973.5	3,059.5	3,241.8	3,420.9	3,445.7	3,429.5	3,416.6	3,437.0	3,451.0	3,517.3
29	2,940.3	2,971.5	3,065.5	3,244.9	3,422.0	3,444.6	3,434.9	3,425.2	3,439.2	3,453.2	3,517.3	
30	2,937.4	2,966.6	3,071.5	3,250.1	3,428.1	3,443.5	3,437.0	3,425.2	3,441.4	3,456.4	3,519.5	
31	2,935.4	2,966.6	3,071.5	3,259.4	3,441.4	3,441.4	3,441.4	3,441.4	3,441.4	3,441.4	3,520.5	

Month	1987						Period 1969 - 1987		
	MOMENTARY MAXIMUM			MOMENTARY MINIMUM			Average Storage	Mean Monthly Storage	
	Elevation	Storage	Day	Elevation	Storage	Day		Average	Maximum
Jan.	1,110.24	2,962.7	! 15	1,109.22	2,902.5	1	2,942.0	2,977.4	4,030.4
Feb.	1,110.07	2,952.9	27	1,109.74	2,933.5	! 2	2,944.9	2,959.7	787.7
Mar.	1,110.45	2,975.4	22	1,110.01	2,949.0	! 2	2,964.3	2,922.3	4,016.4
Apr.	1,112.08	3,071.5	30	1,110.30	2,966.6	1	3,006.2	2,893.3	861.7
May	1,115.06	3,259.4	31	1,112.04	3,071.5	1	3,157.5	2,841.8	982.0
June	1,117.77	3,433.8	21	1,115.06	3,259.4	1	3,395.0	3,286.5	1,038.6
July	1,117.95	3,445.7	27	1,117.31	3,403.8	! 6	3,425.1	2,793.2	914.4
Aug.	1,117.88	3,441.4	! 1	1,117.34	3,405.9	24	3,428.2	2,860.3	996.6
Sept.	1,117.88	3,441.4	1	1,117.37	3,408.1	14	3,419.1	2,912.0	939.3
Oct.	1,117.88	3,441.4	1 30	1,117.49	3,416.0	16	3,425.2	2,917.2	1,034.0
Nov.	1,118.11	3,456.4	30	1,117.70	3,429.5	17	3,437.0	3,061.6	1,027.2
Dec.	1,119.08	3,520.6	31	1,118.14	3,456.4	1	3,490.4	3,407.9	4,211.4
Yearly	1,119.08	3,520.6		1,109.22	2,902.5		3,253.2	2,936.3	3,950.8
									1,047.6

\* When necessary, the Commission may set temporary conservation levels

! And other days

## STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

## INTERNATIONAL FALCON RESERVOIR

Falcon Dam is the lowermost of the major international storage dams authorized for construction on the Rio Grande by the Water Treaty of 1944 between the United States and Mexico and was the first dam constructed. It is located 86.1 river miles downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas and 274.8 river miles upstream from the Gulf of Mexico.

Maximum storage for period of record: 3,490,600 acre-feet on October 19, 1958 with an elevation of 308.11 feet above mean sea level, U. S. C. & G. S. datum.

## STORAGE CAPACITIES

(1971-1972 Survey)

Elevation	Description	At Indicated Elevation		Between Indicated Elevations	
		Reservoir Capacity Acre-Feet	Reservoir Area Acres	Storage Volume Acre-Feet	Type of Storage
175.0	Original River Bed at Dam Axis	0	0	67	Dead
203.3	Lowest Outlet (Mexican Penstock)	67	89	2,667,521	Silt & Conservation
301.2	Top of Conservation Storage *	2,667,588	86,843	509,505	Ordinary Flood
306.7	Top of Spillway Gates	3,177,093	98,512	801,323	Surcharge
314.2	Maximum Water Surface	3,978,416	115,406		

## STORAGE IN THOUSANDS OF ACRE-FEET AT 24:00 HOURS 1987 - ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,728.0	1,957.3	2,142.8	2,322.6	2,227.9	1,996.1	2,354.9	2,458.6	2,614.1	2,706.9	2,703.4	2,755.5
2	1,737.1	1,967.9	2,149.4	2,325.7	2,210.5	1,996.8	2,352.5	2,467.6	2,629.6	2,711.3	2,699.9	2,756.4
3	1,746.9	1,975.6	2,156.1	2,327.3	2,193.3	2,003.9	2,348.5	2,474.1	2,646.8	2,715.7	2,699.0	2,757.2
4	1,751.4	1,982.7	2,162.0	2,328.9	2,182.7	2,009.6	2,343.0	2,480.7	2,663.2	2,720.1	2,699.0	2,757.2
5	1,756.0	1,992.6	2,167.9	2,330.5	2,171.6	2,011.0	2,338.3	2,489.8	2,671.9	2,724.5	2,699.9	2,757.2
6	1,760.6	2,001.8	2,173.9	2,337.5	2,164.2	2,018.8	2,336.7	2,497.2	2,685.0	2,725.4	2,700.7	2,758.1
7	1,765.2	2,011.0	2,180.6	2,339.9	2,162.0	2,048.9	2,337.5	2,502.2	2,694.6	2,726.2	2,704.2	2,757.2
8	1,769.8	2,019.5	2,186.5	2,341.5	2,157.6	2,087.2	2,338.3	2,508.0	2,706.0	2,722.7	2,713.0	2,756.4
9	1,775.8	2,026.0	2,194.8	2,343.0	2,150.9	2,115.6	2,337.5	2,513.8	2,710.4	2,721.8	2,715.7	2,756.4
10	1,780.4	2,031.0	2,201.5	2,344.6	2,145.7	2,139.1	2,335.2	2,517.1	2,709.5	2,720.1	2,716.5	2,756.4
11	1,785.1	2,036.0	2,208.3	2,346.2	2,150.2	2,158.3	2,333.6	2,521.3	2,706.9	2,720.1	2,717.4	2,757.2
12	1,791.7	2,042.4	2,214.3	2,347.0	2,152.4	2,177.6	2,331.2	2,526.3	2,703.4	2,720.1	2,718.3	2,758.1
13	1,796.4	2,048.2	2,221.9	2,346.2	2,151.6	2,198.5	2,328.9	2,528.8	2,697.2	2,720.1	2,720.9	2,757.2
14	1,800.4	2,053.9	2,228.7	2,348.3	2,150.9	2,221.9	2,327.3	2,530.4	2,691.1	2,720.1	2,723.6	2,757.2
15	1,806.4	2,059.7	2,234.7	2,343.8	2,148.0	2,240.8	2,326.5	2,532.1	2,687.6	2,720.9	2,726.2	2,757.2
16	1,811.8	2,065.5	2,242.3	2,343.0	2,142.8	2,258.4	2,325.7	2,533.8	2,684.1	2,721.8	2,738.6	2,757.2
17	1,817.9	2,069.1	2,250.7	2,343.0	2,139.8	2,272.2	2,326.5	2,535.5	2,683.3	2,721.8	2,739.5	2,758.1
18	1,823.2	2,072.0	2,256.8	2,339.9	2,134.7	2,286.1	2,330.5	2,536.3	2,684.1	2,722.7	2,740.4	2,759.0
19	1,830.7	2,076.3	2,261.4	2,334.4	2,126.6	2,298.5	2,335.2	2,537.1	2,683.3	2,722.7	2,745.7	2,761.7
20	1,840.8	2,079.9	2,266.9	2,329.7	2,119.3	2,312.6	2,340.7	2,538.8	2,681.5	2,725.4	2,747.5	2,762.6
21	1,849.6	2,083.6	2,272.2	2,325.7	2,112.0	2,326.5	2,347.0	2,538.8	2,681.5	2,725.4	2,748.4	2,760.8
22	1,858.5	2,086.5	2,278.3	2,321.1	2,104.7	2,335.9	2,352.5	2,539.6	2,682.4	2,725.4	2,749.3	2,760.8
23	1,866.7	2,093.7	2,283.0	2,315.6	2,094.5	2,346.5	2,358.0	2,539.6	2,678.9	2,723.6	2,749.3	2,762.6
24	1,876.3	2,101.0	2,285.3	2,309.3	2,090.8	2,358.0	2,369.1	2,539.6	2,678.0	2,721.8	2,750.1	2,764.4
25	1,886.5	2,109.0	2,290.7	2,302.3	2,084.3	2,361.2	2,381.9	2,539.6	2,682.4	2,720.1	2,751.0	2,765.3
26	1,899.6	2,118.6	2,294.6	2,296.1	2,069.8	2,362.0	2,393.9	2,539.6	2,685.9	2,717.4	2,751.9	2,766.2
27	1,908.6	2,127.4	2,297.7	2,286.1	2,055.4	2,361.2	2,404.3	2,539.6	2,690.2	2,715.7	2,752.8	2,767.0
28	1,919.0	2,135.4	2,302.3	2,273.0	2,041.0	2,361.2	2,418.0	2,541.3	2,696.4	2,711.3	2,752.8	2,767.0
29	1,928.0		2,307.0	2,260.7	2,028.1	2,358.8	2,429.3	2,548.0	2,702.5	2,709.5	2,753.7	2,765.3
30	1,938.5	2,314.0	2,319.5	2,245.4	2,013.1	2,358.8	2,438.2	2,564.9	2,703.4	2,706.0	2,754.6	2,765.3
31	1,948.2		2,319.5		2,001.8		2,448.6	2,592.8		2,704.2		2,765.3

Month	1987						Period 1954 - 1987			
	MOMENTARY MAXIMUM			MOMENTARY MINIMUM			Average Storage	Mean Monthly Storage		
	Elevation	Storage	Day	Elevation	Storage	Day		Average	Maximum	Minimum
Jan.	291.94	1,948.2	31	288.50	1,716.4	1	1,824.4	2,096.9	3,070.8	218.7
Feb.	294.55	2,135.4	28	291.94	1,948.2	1	2,050.8	2,006.7	3,099.6	156.2
Mar.	296.98	2,319.5	31	294.55	2,135.4	1	2,237.0	2,001.5	2,990.8	226.7
Apr.	297.33	2,347.0	12	296.02	2,245.4	30	2,323.1	1,915.6	2,954.6	325.6
May	296.02	2,245.4	1	292.70	2,001.8	31	2,125.1	1,780.3	2,869.9	490.1
June	297.52	2,362.0	26	292.62	1,956.1	1	2,212.8	1,726.8	2,212.8	273.7
July	298.60	2,448.8	31	297.06	2,325.7	16	2,357.1	1,805.3	2,692.7	209.9
Aug.	300.33	2,592.8	31	298.83	2,448.8	1	2,524.3	1,782.8	2,771.4	208.0
Sept.	301.69	2,710.4	9	300.58	2,592.8	1	2,683.8	1,871.5	2,871.1	256.2
Oct.	301.87	2,726.2	7	301.62	2,703.4	1	2,719.0	2,079.3	3,250.2	308.3
Nov.	302.19	2,754.6	30	301.56	2,699.0	1	2,729.4	2,149.5	3,124.5	390.9
Dec.	302.33	2,767.0	27	302.20	2,754.6	1	2,760.1	2,181.9	3,129.7	343.4
Yearly	302.33	2,767.0		288.50	1,716.4		2,378.9	1,949.8	2,764.2	544.3

\* When necessary, the Commission may set temporary conservation levels

! And other days

## QUALITY OF WATER - 1987

## 08-3640.00 RIO GRANDE AT EL PASO, TEXAS

LOCATION: At gaging station on Courchesne Bridge at river mile 1,255.7 (2,020.8 km), 1.7 river miles (2.7 km) upstream from American Dam, and 5.5 miles (8.9 km) upstream from Paso del Norte Bridge between El Paso, Texas and Cd. Juarez, Chihuahua.

RECORDS: Chemical analyses, February 1930 through current year (prior to July 1986 sampling at American Dam); biochemical analyses, September 1943 through 1972 and February 1976 through current year (prior to 1976 samples taken from Franklin Canal at El Paso, Texas); specific conductance, 1930 through 1932 and 1937 through current year (prior to July 1986 samples taken at American Dam); suspended silt, 1947 through 1976 (samples taken at American Dam).

REMARKS: Sampling by International Boundary and Water Commission; chemical analyses by U. S. Geological Survey, biochemical analyses by Haskell R. Street Wastewater Treatment Plant laboratory in El Paso; specific conductance and silt determinations by International Boundary and Water Commission. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, determined and published by U. S. Geological Survey.

1987 Date	Time Standard	Streamflow Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Water Temper- ature Deg C	Hardness, Total (as CaCO <sub>3</sub> ) mg/L	Hardness, Noncarbonate (as CaCO <sub>3</sub> ) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 08 22	0930 0925	2800 369	630 766	8.2 7.8	6.5 3	170 190	36 49	51 58	10 12
Feb. 17	0835	2100	674	7.6	5	180	44	54	11
Mar. 17 18	0930 1100	2190 1950	701 650	7.6 8.1	9 10	180	45 40	54 52	11 11
Apr. 16	0850	1100	824	7.9	15.5	210	51	62	13
May 12 19	1015 1000	2700 1200	690 678	8.1 7.5	20 24	180	39 37	54 55	11 11
June 16 18	1200 0900	1200 1010	920 987	8.3 7.9	26 24	230 240	65 65	69 73	13 15
July 14	1100	2600	644	7.5	30.5	170	35	51	11
Aug. 18	1100	1100	1070	7.7	32	250	78	72	16
Sept. 17	0900	340	1330	7.8	19	290	101	85	19
Oct. 21	1045	326	1760	7.8	14.5	410	164	120	26
Nov. 10 16	1030 0830	350 276	1640 1720	8.6 8.0	11.5 11	380 400	139 154	110 120	25 25
Dec. 08 15	1000 0930	310 210	1700 1800	8.3 7.9	9 4*	380 380	134 141	110 110	25 26

\*Estimated from Riverside Canal and Drain Temperature

1987 Date	Sodium Ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium Ion (K) Dissolved mg/L	Alkalinity Total (as CaCO <sub>3</sub> ) mg/L	Sulfate ion (SO <sub>4</sub> ) Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO <sub>2</sub> ) Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 08 22	64 74	2 2	4.7 4.8	134 141	120 140	44 51	11 12	385 436
Feb. 17	68	2	4.8	136	120	50	4.8	394
Mar. 17 18	65 66	2 2	5.0 4.7	135 140	120 130	44 49	3 13	383 409
Apr. 16	89	2	6.2	159	160	69	15	509
May 12 19	69 70	2 2	5.4 5.3	141 143	120 130	49 47	14 14	407 418
June 16 18	93 110	2 3	5.0 6.4	165 175	160 200	71 84	16 17	526 610
July 14	68	2	5.3	135	130	45	15	406
Aug. 18	130	3	5.7	172	220	110	18	674
Sept. 17	170	4	3.3	189	290	140	21	841
Oct. 21	240	5	9.8	246	380	190	24	1137
Nov. 10 16	210 220	4	9.6 9.4	241 246	410 380	170 170	22 23	1101 1095
Dec. 08 15	220 240	4 5	13.0 9.0	246 239	390 420	180 200	21 24	1106 1172

QUALITY OF WATER - 1987

08-3640.00 RIO GRANDE AT EL PASO, TEXAS

1987	Water Temperature	Oxygen, Dissolved (DO)	pH	Coli-form, Fecal Colonies /100 mL	Oxygen Demand Bio-Chemical (BOD) mg/L	1987	Water Temperature	Oxygen, Dissolved (DO)	pH	Coli-form, Fecal Colonies /100 mL	Oxygen Demand, Bio-Chemical (BOD) mg/L		
	Date	Deg C	mg/L	Units			Date	Deg C	mg/L				
Jan.	8	6.1	10.5	8.2	1070	2	July	16	22.2	7.4	8.0	1190	18
	15	5.6	10.5	8.3	480	3		23	24.4	6.8	8.0	940	9
	22	2.8	11.6	8.1	1240	3		30	24.4	7.4	7.9	1000	5
Feb.	5	8.9	10.0	8.1	1500	2	Aug.	6	23.3	6.8	8.4	<1	6
	12	9.4	9.8	8.4	200	3		13	19.4	7.4	8.1	<1	6
	19	6.7	10.3	8.0	540	2		20	24.4	8.2	8.0	850	4
	26	8.9	9.8	8.2	1060	3		27	18.9	6.9	7.9	1000	5
Mar.	5	10.6	9.6	8.1	1500	3	Sep.	3	17.8	-	-	110	5
	12	11.1	9.6	8.4	580	2		10	21.1	6.8	8.0	220	6
	26	12.2	9.8	8.2	2800	2		17	18.9	7.3	7.9	<1	6
Apr.	2	12.2	9.4	8.2	590	3		24	18.9	6.9	8.0	1700	10
	9	13.3	9.2	8.1	1000	2	Oct.	8	21.1	-	8.1	400	6
	16	15.6	8.8	8.1	1200	2		15	17.8	7.5	8.2	<1	7
May	7	17.2	7.3	8.2	300	1		22	15.6	8.2	8.0	1810	3
	21	17.8	7.3	8.2	540	2		29	16.7	8.0	8.2	1450	4
	28	20.6	8.2	8.0	1100	2	Nov.	5	14.4	8.2	8.0	1700	5
June	4	20.0	8.1	8.0	210	2		12	10.0	9.8	8.1	1100	4
	11	22.2	7.0	7.9	90	6		19	5.6	11.0	8.1	920	7
	18	23.9	8.2	5.9	700	3	Dec.	3	9.4 *	11.3	8.0	1850	5
	20	24.4	6.1	8.1	800	3		17	3.9 *	12.7	8.0	2200	5
July	2	23.3	6.2	8.2	500	4		24	6.7 *	12.0	7.8	1320	8
	9	22.2	6.2	8.0	1000	5		31	5.6 *	12.0	7.9	1540	5

\*Estimated from Riverside Canal and Drain temperature

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

DAY	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1			720	679		660	679		1,270	1,360	1,720	1,690
2	698		727	719		693						
3		666	729	708		663		897	1,460		1,700	1,700
4		694	714		718						1,700	
5		663	700		748	672					1,740	
6	628		710		778		667	944		1,440	1,630	
7	620			721	744		671			1,550		1,710
8			722		662	661						
9			682	735		680	673		1,500			
10	625	768		732		686	651		1,600			
11		680			665	768						
12	652	678	736		668	918						
13	667	571		718			714	1,170		1,280	1,680	
14	641			722			664	1,110	1,390	1,150		
15	661			724			654		1,360	1,270		
16	710			807			672		1,370		1,660	
17		667	635						1,350			
18					661	960		1,080				
19		712	682					1,070				
20	702		668	743				1,070		1,730	1,690	
21	700			805	700					1,720		
22	723			773	659							
23				697		866	693		1,450	1,750		
24			694	730	705				1,470		1,680	
25		672				848			1,410			
					844							
26	680	700			657			1,080			1,660	
27					684						1,710	
28	688			705	664						1,690	
29	634			675	669		778					
30	637		691	684		672	793			1,700	1,740	
31			742					1,070				

## QUALITY OF WATER - 1987

## RIO GRANDE AT RIVERSIDE CANAL HEADING NEAR EL PASO, TEXAS AND Cd. JUAREZ, CHIHUAHUA

LOCATION: At river mile 1,237.3 (1,991.2 km), 9.5 miles (15.3 km) downstream from the Haskell R. Street Waste-water Treatment Plant and 16.7 river miles (26.8 km) downstream from the American Dam at El Paso, Texas.

RECORDS: Biochemical analyses, February 1976 through current year. Samples also collected quarterly and analyses made by the Texas Water Commission at a location one mile upstream at Ysleta-Zaragoza Bridge, 1937 through 1972 and May 1975 through current year.

REMARKS: Sampling by International Boundary and Water Commission. Analyses by the Haskell R. Street Wastewater Treatment Plant laboratory in El Paso.

1987 Date	Water Temper- ature Deg C	Oxygen, Dissolved (DO) mg/L	pH	Coli- form, Fecal Colonies /100 ml	Oxygen Demand, Bio- Chemical (BOD) mg/L	1987 Date	Water Temper- ature Deg C	Oxygen, Dissolved (DO) mg/L	pH	Coli- form, Fecal Colonies /100 ml	Oxygen Demand, Bio- Chemical (BOD) mg/L
Jan. 8	7.8	10.0	8.1	-	4	Jul. 9	23.3	6.6	7.9	590	11
15	7.2	10.2	8.3	<1	6	16	22.8	7.3	3.9	290	36
22	3.3	11.3	7.9	2	5	23	25.6	6.2	8.1	20	11
Feb. 5	9.4	9.8	8.0	20	4	30	25.0	7.2	7.8	1000	11
12	11.1	9.5	8.3	17000	5	Aug. 6	22.8	7.2	8.1	400	9
19	8.9	10.0	8.0	230	4	13	25.6	7.4	8.2	-	7
26	8.3	9.8	7.9	73	4	20	25.6	8.1	7.8	270	6
Mar. 5	11.7	9.4	8.0	4	4	27	21.1	7.0	7.9	1000	5
12	11.7	9.4	7.7	8	2	Sep. 3	23.2	-	-	900	9
26	11.1	9.6	8.0	<1	4	10	23.3	6.4	7.8	2800	9
Apr. 2	12.8	9.2	7.9	40	6	17	21.1	7.0	7.7	510	9
9	14.4	9.0	8.0	18	4	24	23.3	6.9	7.8	150	10
16	16.7	8.4	8.1	26000	3	Oct. 8	22.2	-	7.6	1	10
23	13.9	9.0	8.1	50	4	15	17.8	6.8	7.9	120	10
May 7	19.4	8.4	8.0	40	3	22	17.8	7.6	7.8	620	7
21	18.9	7.9	8.0	200	5	29	18.9	8.2	8.0	58	9
28	17.8	7.7	8.0	200	5	Nov. 5	17.8	8.6	7.6	6	7
Jun 4	21.1	7.9	8.0	140	6	12	12.2	8.4	7.7	36	6
11	22.2	7.6	7.9	600	4	19	7.8	11.4	7.8	800000	46
18	25.0	8.0	6.6	1100	20	Dec. 3	9.4 *	9.4	7.7	3200	10
25	25.6	6.1	8.1	1190	29	17	3.9 *	10.5	7.7	1	6
July 2	25.0	6.4	8.1	800	9	24	6.7 *	10.2	7.3	2	12
						31	5.6 *	9.6	6.8	1	10

\*Estimated from Riverside Canal and Drain temperature

## 08-3705.00 RIO GRANDE AT FORT QUITMAN, TEXAS NEAR COLONIA LUIS LEON, CHIHUAHUA

LOCATION: Gaging station at river mile 1,173.2 (1,888.1 km), 1.5 river miles (2.4 km) downstream from old Fort Quitman.

RECORDS: Chemical analyses, February 1938 through current year; biochemical analyses, October 1974 through current year; specific conductance (daily), October 1974 through 1977.

REMARKS: Sampling and analyses by U. S. Geological Survey. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, determined and published by the U. S. Geological Survey. Sampling prior to 1977 by the International Boundary and Water Commission.

1987 Date	Time Std. Sec.-Ft.	Stream flow, Momen- tary Micromhos	Specific Conduct- ance pH	Water Temper- ature Deg C	Hard- ness, Total (as CaCO <sub>3</sub> ) mg/L	Hard- ness, Noncar- bonate (as CaCO <sub>3</sub> ) mg/L	Calcium ion (Ca), Dis- solved mg/L	Magnes- ium ion (Mg), Dis- solved mg/L	Sodium ion (Na), Dis- solved mg/L	Sodium AdSORP- Tion Ratio (SAR)	Potassium ion (K), Dissolved mg/L
Jan. 9	1100	1700	930	8.0	7	210	59	63	13	110	3
Mar. 17	1105	1090	1090	8.0	10	230	78	67	15	130	5.8
May 13	1045	1200	1370	7.9	21	280	117	81	19	170	4
June 17	1315	200	2480	8.4	29	460	279	130	32	340	6
Sept. 17	1200	400	2030	8.1	22	---	---	---	---	---	---
Dec. 9	1230	410	2960	8.1	9.5	520	260	150	37	420	7
											14.0

1987 Date	Alka- linity Total (as CaCO <sub>3</sub> ) mg/L	Sulfate ion (SO <sub>4</sub> ), Dis- solved mg/L	Chloride ion (Cl), Dis- solved mg/L	Silica (SiO <sub>2</sub> ), Dis- solved mg/L	Oxygen, Dis- solved (DO) mg/L	Coli- form, Fecal Colts./ 100 ml	Turbidity NTU	Solids Dis- solved (Calcu- lated) mg/L	Solids Dis- solved (Residue @ 180 Deg C) mg/L	Solids Dis- solved (Residue @ 180 Deg C) mg/L	Sus- pended Sedi- ment mg/L
Jan. 9	151	160	100	14	10.8	1100B	130	556	567	1350	
Mar. 17	152	190	140	14	10.2	2000	190	653	679	726	
May 13	163	240	200	17	7.4	320	120	831	838	575	
June 17	181	420	450	15	8.2	130	100	1496	1540	397	
Sept. 17	184	--	--	--	7.5	---	---	748	----	706	
Nov. 12	252	490	440	29	8.6	220	39	1748	1860	---	
Dec. 9	260	510	500	28	8.1	120	20	1814	1860	---	

B Results based on colony count outside the acceptance range (non-ideal colony count)

## QUALITY OF WATER - 1987

## 08-3715.00 RIO GRANDE ABOVE RIO CONCHOS NEAR PRESIDIO, TEXAS AND OJINAGA, CHIHUAHUA

LOCATION: Gaging station at river mile 966.4 (1,555.3 km); 5.1 river miles (10.5 km) upstream from the Rio Conchos.

RECORDS: Chemical analyses, February 1933 through 1981; specific conductance, 1931 and 1935 through current year.

REMARKS: Sampling by the International Boundary and Water Commission; chemical analyses by the U.S. Geological Survey; determinations for specific conductance by International Boundary and Water Commission. Results of biochemical analyses by Texas Water Commission, November 1977 through current year, available on request.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

January	March	May	July	August	October	November
5 1,340	4 1,670	1 1,910	15 1,500	12 1,700	10 2,820	4 2,840
12 1,360	17 2,100	22 1,680	23 3,050	19 1,970	16 3,090	17 2,710
22 1,430	April	June	24 1,530	September	23 3,410	December
2 1,740	6 2,070	3 1,590	29 1,430	29 2,100	27 2,480	2 2,960
18 1,550	16 1,860	15 1,440				15 3,000
	22 1,820					

## 08-3730.00 RIO CONCHOS NEAR OJINAGA, CHIHUAHUA

LOCATION: At gaging station, 1.5 river miles (2.5 km) from the confluence with the Rio Grande, which is located at river mile 961.4 (1,547.2 km).

RECORDS: Chemical analyses, February 1935 through 1981; suspended silt, 1956 through 1979, specific conductance, 1935 through current year.

REMARKS: Sampling and determinations for suspended silt and specific conductance by the International Boundary and Water Commission; chemical analyses by the U. S. Geological Survey.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

DAY	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1					1,110	1,120	1,210	1,260				
2		1,710							1,060	1,030	1,410	1,540
3			1,100	1,120		1,200	1,280	1,040				3,000
4		1,700	1,090		1,130		1,090		1,100		1,420	1,540
5	1,450			1,150				1,060		1,020		
6		1,710	1,010		1,210		1,260					
7								1,040	1,140	1,020		1,430
8		1,460			1,130	1,070	935	1,270				
9									1,140			1,290
10		1,500	1,410	1,000	1,140		840	1,340	1,040	1,020		2,950
11			1,360	1,010	1,070		1,140		1,130			1,280
12								1,140		1,010		
13			1,280	1,020	1,170	1,100	1,340					
14								1,050	1,110	1,020		
15						1,180	1,110	1,190				1,290
16								734				
17								980	1,100			
18									1,110			
19									831			
20										984		1,770
21												
22										1,190		
23										1,040		
24										1,070		
25										1,020		1,630
26	1,720											
27										1,070		
28	1,680		1,100	1,140	1,210		1,270	1,060	1,090			1,610
29										1,070		
30	1,730		1,100					927	1,040			
31										1,040	1,250	1,560

## 08-3742.00 RIO GRANDE BELOW RIO CONCHOS NEAR PRESIDIO, TEXAS AND OJINAGA, CHIHUAHUA

LOCATION: Gaging station at river mile 949.8 (1,258.5 km); 0.4 river mile (0.6 km) downstream from Alamito Creek and 11.6 river miles (18.7 km) downstream from the Rio Conchos.

RECORDS: Specific conductance, 1956 through current year.

REMARKS: Sampling and determinations for specific conductance by the International Boundary and Water Commission. Results of biochemical analyses by Texas Water Commission, November 1977 through current year, available on request.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

January	March	April	June	July	September	November
5 1,420	4 1,500	17 1,630	4 1,440	2 2,080	21 2,980	3 2,130
12 1,410	17 1,550	May	16 1,380	16 987	30 1,730	17 2,430
18 1,400	April	1 1,550	22 1,530	28 1,300	October	December
21 1,630	3 1,550	21 1,450	24 1,970	August	4 1,550	2 2,400
February	6 1,640			18 1,390	16 1,620	
2 1,800					26 1,740	

## QUALITY OF WATER - 1987

## 08-3772.00 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TEXAS AND RANCHO SANTA ROSA, COAHUILA

**LOCATION:** Gaging station at river mile 657.5 (1,058.2 km), about 12.3 miles (19.8 km) west of Langtry, Texas.  
**RECORDS:** Chemical analyses, March 1969 through 1970 and October 1974 through current year; biochemical, October 1974 through current year; suspended silt, 1969 through current year; specific conductance, 1969 through 1981, 1983, 1985 through current year.

**REMARKS:** Sampling and analyses by U. S. Geological Survey; sampling and determinations for suspended silt and specific conductance by the International Boundary and Water Commission. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, determined and published by the U. S. Geological Survey.

1987	Time	Stream flow, Momentary	Specific Conductance	pH	Water Temperature	Hardness, Total (as CaCO <sub>3</sub> )	Hardness, Noncarbonate (as CaCO <sub>3</sub> )	Calcium ion (Ca), Dissolved	Magnesium ion (Mg)	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio (SAR)	Potassium ion (K), Dissolved
Date	Std.	Sec.-Ft.	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L
Jan. 7	1415	4,190	1,350	8	14.5	320	143	94	20	170	4	5.7
May 13	1350	4,320	1,430	8.3	25	310	131	93	19	190	4	6.9
Aug. 25	1455	3,130	1,580	7.5	28	350	202	110	18	200	4	8.3
Nov. 18	1055	1,000	1,670	8.3	15.5	350	184	<98	26	210	4	6.7

1987	Alka-linity Total (as CaCO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ), Dis-solved	Chloride ion (Cl), Dis-solved	Silica (SiO <sub>2</sub> ), Dis-solved	Oxygen, Dis-solved (DO)	Coliform, Fecal	Oxygen Demand, Bio-Chemical (BOD) 5 Day	Tur-bidity	Solids Dis-solved (Calculated)	Solids Dis-solved (Residue @ 180 Deg C)	Solids Dis-solved (Residue @ 180 Deg C)	Sus-pended Sediment
Date	mg/L	mg/L	mg/L	mg/L	mg/L	Cols./100 mL	mg/L	NTU	mg/L	mg/L	mg/L	mg/L
Jan. 7	177	280	180	13	12.4	16B	1.2	130.0	868	859	382	
May 13	179	310	170	19	8.9	480	3.2	390.0	915	931	1,630	
Aug. 25	148	370	200	22	9.2	380B	1.5	410.0	1,017	1,030	1,580	
Nov. 18	166	370	190	22	11.6	20	3.6	33.0	1,022	1,070	91	

B Results based on colony count outside the acceptance range (non-ideal colony count)

## SUSPENDED SILT - 1987

	Stream-flow, Momentary	Gravimetric Percent		Time	Stream-flow, Momentary	Gravimetric Percent		Time	Stream-flow, Momentary	Gravimetric Percent	
Date	Time	Sec.-Ft.	Date	Time	Sec.-Ft.	Date	Time	Sec.-Ft.	Date	Sec.-Ft.	Percent
Jan. 2	1215	3,430	0.00408	May 4	1000	2,770	1.56864	Sep. 8	1230	2,500	0.00716
20	1430	3,100	0.0802	18	0845	3,280	0.11956	21	1100	1,700	0.26998
Feb. 2	1145	2,310	0.00352	June 1	0900	5,640	0.00344	Oct. 5	0900	2,060	0.00556
17	1000	2,460	0.00668	15	0830	3,130	0.64904	19	1200	1,700	0.01692
Mar. 2	1155	2,830	0.01484	July 6	1100	1,700	0.3066	Nov. 2	1145	1,400	0.14940
16	1100	3,130	0.34248	20	1000	3,250	0.01584	17	1320	1,010	0.24096
Apr. 6	1000	2,390	0.00516	Aug. 3	1030	3,220	1.5934	Dec. 7	1130	930	0.06680
				17	0930	2,590	0.27000	21	1000	1,260	0.01408

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CN @ 25 DEG C - 1987

January	March	May	June	August	September	November
2 1,400	2 1,400	4 1,390	15 1,330	4 1,220	21 1,530	3 1,270
20 1,310	16 1,290	19 1,270	July	17 1,170	October	17 1,610
February	April	June	6 1,310	September	5 1,030	December
4 1,580	7 1,400	2 1,140	20 1,050	9 1,510	19 1,460	7 1,750
17 1,480						21 1,650

## QUALITY OF WATER - 1987

## 08-4474.10 PELOS RIVER NEAR LANGTRY, TEXAS

LOCATION: At gaging station, 15.0 river miles (24.1 km) from the confluence with the Rio Grande, which is located at river mile 616.0 (991.4 km).

RECORDS: Chemical analyses, 1967 through current year; biochemical analyses, October 1974 through current year; suspended silt, November 1954 through 1976; specific conductance daily, 1969 through September 1985 and biweekly through current year.

REMARKS: Sampling and analyses by U. S. Geological Survey; sampling and determinations for specific conductance by the International Boundary and Water Commission. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, determined and published by the U. S. Geological Survey.

1987	Time	Stream	Specific	Water	Hard-	Calci-	Sodium	Sodium	Potassium	
		flow,	Conduct-							
Date	Std.	Sec.-Ft.	Micromhos	Units	Deg C	Total (as CaCO <sub>3</sub> )	Noncar-	Sodium	Ratio (SAR)	Dissolved
Jan. 7	1030	380	5500	8.1	13	1440	1268	330	150	8
Mar. 18	1200	365	5870	8.1	17	1030	871	230	110	850
May 13	1000	286	6000	8.2	25	1070	926	230	120	960
July 7	1500	552	5320	8.1	28	1070	942	270	95	790
Aug. 25	1050	238	5270	8.0	27	890	758	190	100	750
Nov. 18	1450	242	5010	8.3	14.5	910	752	210	93	770

1987	Alka-	Sulfate	Chlo-	Silica	Oxygen,	Coli-	Oxygen	Solids	Solids	Sus-
	linity	Ion	ride		(Cl <sup>-</sup> )	Dis-	Dis-			
Date	Total (as CaCO <sub>3</sub> )	Dis-	Ion	(SiO <sub>2</sub> )	Dissolved	Solved	Bio-	Solved (Calcu-	Residue at 180	Sedi-
Jan. 7	172	900	1400	13	10.1	2B	1.0	.4	3638	3670
Mar. 18	159	830	1400	11	11.0	3B	1.2	.3	3538	3510
May 13	144	900	1500	11	8.2	26	1.7	.7	3819	3860
July 7	128	960	1200	17	9.0	15B	3.2	.8	3420	3590
Aug. 25	132	910	1100	18	8.1	7B	.8	2.3	3161	3500
Nov. 18	158	770	1300	16	12.0	6B	2.3	.6	3267	3300

B Results based on colony count outside the acceptance range (non-ideal colony count)

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

January	February	April	May	July	September	November
5 5,320	17 4,700	6 4,440	18 5,310	6 4,770	8 4,850	2 5,490
20 4,510	March	20 4,830	June	20 5,060	October	16 4,920
February	2 5,580	May	1 3,560	August	5 4,470	December
2 4,740	16 5,560	4 5,330	15 4,020	3 4,570	19 5,950	4 4,390
				16 5,660		21 5,160

## 08-4494.00 DEVILS RIVER AT PAFFORD CROSSING NEAR COMSTOCK, TEXAS

LOCATION: At gaging station 25.5 river miles (41.0 km) from the confluence with the Rio Grande, which is located at river mile 574.6 (924.7 km).

RECORDS: Daily specific conductance, 1968 through September 1985; biweekly specific conductance through current year.

REMARKS: Sampling and determinations for specific conductance by the U. S. Geological Survey through September 1985. Sampling prior to 1978 and since October 1985 by the International Boundary and Water Commission. Chemical and biochemical analyses, 1978 through current year, available from U. S. Geological Survey.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

January	March	April	June	July	September	November
20 471	16 452	20 480	1 370	20 789	7 361	7 542
February	16 456	May	15 376	August	21 403	16 413
2 434	April	4 401	July	3 283	October	December
17 665	6 404	18 431	6 578	17 395	5 444	7 546
				18 436	18 436	21 429

## QUALITY OF WATER - 1987

## 08-4509.00 RIO GRANDE BELOW AMISTAD DAM NEAR Cd. ACUNA, COAHUILA AND DEL RIO, TEXAS

**LOCATION:** Gaging station at river mile 571.8 (920.3 km), 2.2 river miles (3.4 km) downstream from Amistad Dam.  
**RECORDS:** Chemical analyses, July 1968 through current year; suspended silt, 1969 through 1976; specific conductance 1968 through current year.  
**REMARKS:** Sampling for chemical analyses by the International Boundary and Water Commission, analyses by the U. S. Geological Survey. Sampling and determinations for specific conductance by the International Boundary and Water Commission.

1987 Date	Time Standard	Streamflow Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Water Temper- ature Deg C	Hardness, Total (as CaCO <sub>3</sub> ) mg/L	Hardness, Noncarbonate (as CaCO <sub>3</sub> ) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 21	0730	4,590	1,190	8.0	15.5	280	145	81	18
Feb. 18	0800	2,330	1,270	7.9	12	310	165	90	20
Mar. 18	0800	2,290	1,280	7.9	16.5	310	162	89	21
Apr. 15	0700	918	1,210	8.1	14	300	154	87	20
May 20	0730	283	1,240	7.8	23.5	300	154	87	20
June 19	1300	4,520	1,280	7.9	20	300	153	86	20
July 15	0700	1,070	1,230	7.8	19	300	154	86	20
Aug. 19	0800	4,060	1,300	7.8	19.5	310	160	88	21
Sept. 17	0800	1,980	1,310	7.7	20	310	158	91	21
Oct. 21	0715	154	1,330	7.5	18.5	310	164	89	21
Nov. 18	0800	2,020	1,350	7.8	19.5	300	170	83	22
Dec. 16	0845	1,370	1,320	7.9	14	300	168	82	22

1987 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K) Dissolved mg/L	Alkalinity Total (as CaCO <sub>3</sub> ) mg/L	Sulfate ion (SO <sub>4</sub> ) Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO <sub>2</sub> ) Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 21	150	3	5.5	135	250	150	15	750
Feb. 18	160	3	5.5	145	270	190	14	836
Mar. 18	160	3	6.1	148	270	190	14	838
Apr. 15	150	3	5.7	146	250	170	14	784
May 20	150	3	5.4	146	250	170	14	784
June 19	150	3	5.5	147	240	170	14	773
July 15	150	3	5.8	146	260	170	14	793
Aug. 19	160	3	5.2	150	270	160	15	809
Sept. 17	160	3	3.5	152	250	180	16	812
Oct. 21	170	4	5.9	146	250	180	16	819
Nov. 18	160	4	6.2	130	270	180	15	814
Dec. 16	160	4	6.2	132	280	180	15	824

QUALITY OF WATER - 1987

08-4509.00 RIO GRANDE BELOW AMISTAD DAM NEAR Cd. ACUNA, COAHUILA AND DEL RIO, TEXAS

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

DAY	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1				1,240	1,250	1,260	1,300		1,280	1,360	1,300	
2	1,270	1,300	1,210		1,290			1,300				1,330
3					1,250	1,260			1,350		1,300	1,300
4								1,270		1,340		
5	1,230		1,310	1,210								
6					1,240		1,290	1,280		1,310		1,310
7					1,290				1,280			1,310
8	1,190	1,320	1,210		1,280	1,240	1,240	1,280		1,350	1,310	
9									1,280			
10	1,180	1,280	1,230		1,380		1,260	1,270	1,290		1,310	1,320
11						1,240			1,320			1,300
12	1,250	1,350	1,250				1,260	1,260				
13			1,390	1,250	1,260	1,250		1,270	1,310	1,320	1,330	
14	1,290					1,240	1,260	1,240	1,260			1,390
15												
16	1,280		1,370						1,290	1,320	1,350	1,310
17		1,300		1,230				1,270	1,290			
18		1,320				1,240		1,280		1,340		1,320
19									1,310		1,310	1,320
20	1,170	1,310	1,280	1,230	1,250			1,260				1,360
21	1,180								1,300	1,340	1,310	
22												1,330
23	1,160	1,290	1,220		1,250	1,240	1,280	1,250		1,300	1,310	1,330
24												1,760
25			1,320	1,300					1,320	1,340		1,330
26						1,260	1,260		1,330		1,290	
27	1,170	1,270	1,310	1,190		1,260		1,250		3,480		1,330
28	1,190								1,280	1,370	1,290	1,360
29										1,310		
30	1,230			1,210				1,290			1,310	1,320
31									1,280	1,300		1,340

## QUALITY OF WATER - 1987

## 08-4557.00 RIO GRANDE NEAR JIMENEZ, COAHUILA AND QUEMADO, TEXAS

LOCATION: Near gaging station at Maverick Canal Headgates. The canal intake is at river mile 543.6 (874.9 km) 13.3 river miles (21.5 km) above the gaging station.

RECORDS: Specific conductance, 1954 through current year.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

DAY	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,150	1,140	1,290	1,190	1,090	956	1,230	1,550	1,300	1,220	1,420	
2	1,150	1,150	1,300	1,210	1,120	1,130	1,260	1,270	1,210	1,210	1,420	
3	1,210	1,170	1,220	1,210	1,120	1,230	1,260	1,260	1,180	1,200	1,410	
4	1,150	1,190	1,080	1,220	1,180	1,220	1,220	1,250	1,180	1,210	1,410	
5	1,140	1,200	1,110	1,240	1,100	1,250	1,220	1,190	1,230	1,210	1,430	
6	1,190	1,200	1,120	1,260	1,240	1,270	1,240	1,210	1,190	1,220	1,430	
7	1,170	1,220	1,120	1,240	1,260	1,260	1,230	1,240	1,190	1,230	1,420	
8	1,130	1,180	1,090	1,260	1,240	1,190	1,260	1,190	1,260	1,190	1,420	
9	1,150	1,180	1,090	1,220	1,220	1,250	1,200	1,260	1,190	1,250	1,210	
10	1,200	1,180	1,120	1,230	1,250	1,230	1,190	1,270	1,270	1,260	1,420	
11	1,200	1,200	1,100	1,190	1,210	1,260	1,230	1,250	1,290	1,220	1,430	
12	1,170	1,190	1,100	1,160	1,200	1,220	1,180	1,190	1,270	1,180	1,430	
13	1,250	1,260	1,110	1,170	1,240	1,230	1,190	1,240	1,250	1,180	1,420	
14	1,190	1,280	1,230	1,180	1,180	1,240	1,150	1,230	1,310	1,170	1,420	
15	1,210	1,290	1,230	1,170	1,180	1,240	1,210	1,250	1,190	1,160	1,420	
16	1,230	1,280	1,230	1,200	1,160	1,240	1,200	1,290	1,180	1,150	1,420	
17	1,250	1,250	1,300	1,210	1,180	1,260	1,240	1,220	1,170	1,120	1,430	
18	1,140	1,330	1,220	1,180	1,160	1,240	1,240	1,150	1,190	1,130	1,420	
19	1,110	1,300	1,240	1,180	1,170	1,270	1,200	1,150	1,190	1,100	1,420	
20	1,100	1,300	1,250	1,170	1,160	1,180	1,230	1,160	1,190	1,100	1,420	
21	1,110	1,200	1,210	1,170	1,110	1,250	1,180	1,240	1,200	1,100	1,430	
22	1,110	1,190	1,230	1,170	1,160	1,270	1,200	1,220	1,250	1,100	1,420	
23	1,080	1,220	1,200	1,180	1,110	1,270	1,160	1,180	1,220	1,110	1,420	
24	1,120	1,220	1,210	1,190	1,160	1,230	1,180	1,230	1,190	1,120	1,420	
25	1,190	1,220	1,190	1,170	1,110	1,270	1,160	1,260	1,200	1,110	1,420	
26	1,200	1,210	1,230	1,230	1,160	1,260	1,190	1,260	1,210	1,120	1,430	
27	1,200	1,210	1,280	1,210	1,110	1,270	1,270	1,240	1,130	1,240	1,420	
28	1,200	1,220	1,230	1,160	1,150	1,270	1,270	1,260	1,180	1,130	1,420	
29	1,200		1,210	1,150	1,120	1,240	1,270	1,280	1,170	1,150	1,420	
30	1,200		1,160		1,160	1,240	1,280	1,290	1,240	1,180	1,420	
31	1,190		1,140					1,290		1,190	1,430	

## 08-4587.00 RIO GRANDE NEAR EL INDIO, TEXAS AND VILLA GUERRERO, COAHUILA

LOCATION: Gaging station at river mile 460.4 (741.0 km), 35.9 river miles (57.8 km) downstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila.

RECORDS: Specific conductance 1954 through current year.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

January	February	April	May	July	September	November
7 995	18 1,100	2 1,110	19 1,010	2 1,030	2 974	4 1,030
20 1,060	March	15 1,120	June	14 1,020	16 1,080	16 1,060
February	2 1,120	May	4 718	August	October	December
10 1,080	17 1,150	6 1,050	18 896	3 1,020	7 1,020	2 830
				18 1,110	19 1,040	15 807

## QUALITY OF WATER - 1987

## 08-4590.00 RIO GRANDE AT NUEVO LAREDO, TAMAULIPAS AND LAREDO, TEXAS

LOCATION: Samples for biochemical analyses, specific conductance, and suspended silt collected at the Laredo Water Plant, river mile 364.0 (585.8 km); for chemical and biochemical analyses at International Bridge II, river mile 360.6 (580.3 km).

RECORDS: Chemical analyses, 1955 through 1976; chemical and biochemical analyses, 1973 through September 1986; biochemical analyses, September 1968 through current year; suspended silt, 1953 through current year; specific conductance, 1948-1949 and 1955 through current year.

REMARKS: Field parameter samples for biochemical analyses, suspended silt and specific conductance collected and analyzed by the International Boundary and Water Commission and the Texas Water Commission. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, available from U. S. Geological Survey through September 1986.

1987 Date	Time Std. Sec.-Ft.	Stream- flow, Momen- tary Micro- mhos	Specific Conduct- ance pH Units	Water Tem- pera- ture Deg C	Oxygen Dis- solved (DO) mg/L	Coli- form, Fecal Cols./ 100 mL	Oxygen Demand, Bio- Chemical (BOD) 5 Day mg/L	Alkalinity Total (as CaCO <sub>3</sub> ) mg/L	Sulfate ion (SO <sub>4</sub> ) Dis- solved mg/L	Chloride ion (Cl), Dis- solved mg/L	Solids Dis- solved (Residue @ 180 Deg C) mg/L	Sus- pended Sedi- ment mg/L	
Jan. 14	1050	3,460	956	--	12.7	9.6	40	1	---	199	112	600	15
Feb. 10	0940	5,310	1075	--	14.4	10.0	60	2	---	219	133	696	68
Mar. 05	1020	4,890	1221	8.1	16.5	5.5	30	---	---	220	126	---	62
Apr. 08	1045	3,490	1079	--	15.3	10.0	35	1	---	217	135	684	19
May 12	1050	8,240	965	7.7	26.4	7.4	--	1	---	187	115	600	250
June 23	1655	9,390	1027	7.9	30.1	6.9	90	---	141	194	113	119	
July 14	1045	4,340	869	7.8	28.9	7.4	60	1	---	157	98	572	44
Aug. 18	1055	3,170	1065	7.8	28.5	7.2	80	1.5	---	212	132	676	41
Sept. 17	1030	4,840	1151	8.1	27.6	7.0	9	---	149	193	127	62	
Oct. 14	1125	3,970	1072	8.0	22.6	8.2	60	2.5	---	204	138	706	40
Nov. 30	0820	1,410	985	7.9	14.6	9.3	--	---	146	149	88	13	
Dec. 16	1110	1,220	769	8.7	11.0	10.0	15	2	---	132	73	464	16

## SUSPENDED SILT - 1987

Month	Tons		Number of Samples	Gravimetric Percentages			Acre-Feet at 1,452 Tons/Ac.Ft.	1968-1987 Period of Record		
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum
	388,851,000	9,950	31	0.00256			6.9	5.7	20.9	0.93
Jan.	360,924,000	13,570	28	.00376			9.3	11.4	109	.88
Feb.	371,680,000	12,340	31	.00332			8.5	11.8	62.7	1.8
Mar.	230,184,000	28,450	30	.01236			19.6	28.6	251	.69
Apr.	247,598,000	51,400	31	.02076			35.4	45.8	165	1.1
May	756,487,000	188,800	30	.02496	0.05632	0.01636	130.0	66.3	688	.56
June	545,443,000	111,500	31	.02044			76.8	56.1	418	1.3
July	485,087,000	25,800	31	.00532			17.8	46.6	313	2.3
Aug.	449,153,000	30,900	30	.00688			21.3	64.4	700	3.3
Sept.	297,872,000	14,100	31	.00472			9.7	53.9	286	1.7
Oct.	220,749,000	8,390	30	.00380			5.8	8.2	27.3	.81
Nov.	136,051,000	3,160	31	.00232			2.2	10.0	77.4	.66
Year	4,490,079,000	498,360	365	.00927			343.3	408.8	1,626.9	95.07

## QUALITY OF WATER - 1987

08-4590.00 RIO GRANDE AT NUEVO LAREDO, TAMAULIPAS AND LAREDO, TEXAS

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

DAY	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,010	1,070	1,110	1,190	1,020	704	968	965	846	968	944	842
2	1,010	1,100	1,120	1,190	1,020	706	960	971	852	956	936	756
3	1,040	1,100	923	1,170	1,020	599	882	998	870	948	936	759
4	1,050	1,110	1,070	862	997	427	1,010	1,010	783	942	959	816
5	1,050	990	1,090	751	763	494	1,000	1,020	987	937	965	805
6	872	1,100	1,080	1,110	961	591	1,020	1,010	956	966	967	806
7	993	1,100	1,080	1,100	916	574	1,010	1,050	957	989	971	808
8	926	1,100	1,070	1,090	961	576	1,010	1,030	1,030	1,010	966	796
9	1,000	1,110	1,080	1,090	981	519	1,030	1,040	1,050	972	951	812
10	975	1,110	1,070	949	966	572	1,030	887	1,020	919	944	801
11	985	1,120	855	1,150	1,010	596	1,030	1,020	1,030	902	944	792
12	993	1,100	1,060	1,160	1,020	638	979	1,040	1,040	1,010	919	799
13	994	779	852	1,140	955	708	939	1,070	1,020	1,040	921	796
14	1,040	693	1,070	1,110	824	762	599	1,070	1,010	1,120	927	795
15	992	801	1,080	1,080	705	801	602	1,050	1,020	1,050	941	755
16	754	1,130	1,100	1,080	786	736	898	1,050	1,020	1,070	945	780
17	964	1,160	1,100	1,110	950	788	909	1,060	1,050	1,080	938	770
18	974	1,180	935	1,120	972	821	935	1,080	1,020	1,050	972	793
19	1,010	1,190	1,110	1,120	879	853	949	1,090	1,010	1,070	1,070	802
20	1,040	1,190	1,170	1,120	877	906	927	1,110	1,000	1,080	1,040	802
21	1,130	768	1,190	1,120	899	941	654	1,090	924	1,090	1,010	
22	1,090	1,110	1,180	1,110	946	957	854	1,050	932	1,040	1,020	786
23	1,050	1,130	1,150	1,070	930	969	697	1,070	903	1,020	1,040	823
24	817	1,140	1,170	1,020	878	932	923	1,030	912	979	1,050	896
25	1,050	1,140	1,140	1,060	906	952	977	1,090	927	958	1,060	775
26	1,060	1,120	1,150	1,080	845	971	958	1,090	894	965	1,050	813
27	1,050	1,090	1,200	1,050	823	978	974	1,090	888	939	1,010	908
28	1,050	1,100	1,200	742	916	983	988	1,090	919	928	931	943
29	1,050		1,150	990	926	980	1,010	1,060	945	947	886	939
30	850		1,170	1,020	968	978	1,010	1,010	951	958	842	967
31	709		1,160		700		993	937		967		968

## QUALITY OF WATER - 1987

## 08-4613.00 RIO GRANDE BELOW FALCON DAM NEAR FALCON, TEXAS AND NUEVA Cd. GUERRERO, TAMAULIPAS

LOCATION: Chemical and specific conductance samples from Falcon Reservoir at Falcon Dam, river mile 274.8 (442.3 km), and biochemical sampling at the Chapeno gaging station 2.5 river miles (4.1 km) below Falcon Dam; latitude 26° 31' 45", longitude 99° 09' 30".

RECORDS: Chemical analyses, July 1955 through current year; biochemical analyses, July 1975 through current year; suspended silt, July 1955 through 1976; specific conductance 1955 through current year.

REMARKS: Sampling for chemical analyses by the International Boundary and Water Commission at Falcon Village Water Plant, analyses by the U. S. Geological Survey; sampling and determinations for specific conductance by the International Boundary and Water Commission at Falcon Dam Power Plant tailrace; biochemical analyses, collected and analyzed by the International Boundary and Water Commission and the Texas Water Commission.

1987	Time	Streamflow Momentary	Specific Conductance	pH	Water Tempera- ture	Hardness, Total (as CaCO <sub>3</sub> )	Hardness, Noncarbonate (as CaCO <sub>3</sub> )	Calcium ion (Ca), Dissolved	Magnesium ion (Mg), Dissolved
Date	Standard	Second-Foot	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L
Jan. 22	1500	98	972	7.9	13.5	240	122	68	17
Feb. 20	1545	491	969	7.8	15.5	240	119	69	17
Mar. 23	1330	413	980	7.9	16.5	250	127	72	18
Apr. 17	1045	3,610	1,010	7.9	19	260	130	74	18
May 18	1130	4,230	1,010	7.6	21	260	129	74	18
June 16	0915	100	1,020	7.6	23.5	250	114	74	17
July 13	0915	5,060	1,010	7.6	26	250	125	70	18
Aug. 20	1100	3,710	988	7.8	28	240	119	67	18
Sept. 18	1130	4,000	990	7.8	28.5	240	124	67	18
Oct. 19	0930	2,750	1,020	7.7	26	250	129	70	18
Nov. 16	0945	10	1,020	7.8	21	250	127	71	18
Dec. 14	1030	1000	1,020	7.8	19	250	126	69	19

1987	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio(SAR)	Potassium ion (K) Dissolved	Alkalinity Total (as CaCO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ) Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO <sub>2</sub> ) Dissolved	Solids Dissolved (Calculated)
Date	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 22	110	3	5.0	118	210	110	12	602
Feb. 20	110	3	4.7	121	210	110	12	605
Mar. 23	110	3	5.2	123	210	110	13	612
Apr. 17	110	2	5.2	130	210	120	13	628
May 18	110	2	4.8	131	200	120	14	619
June 16	110	2	4.9	136	210	120	14	631
July 13	110	3	4.2	125	210	120	13	620
Aug. 20	110	3	4.7	121	210	120	13	615
Sept. 18	110	3	2.7	116	210	120	13	610
Oct. 19	120	3	5.1	121	200	120	14	619
Nov. 16	110	3	5.1	123	190	120	14	601
Dec. 14	120	3	5.5	124	220	130	14	651

1987	Stream- flow, Momen- tary	Specific Conduct- ance	pH	Water Tem- pera- ture	Oxygen, Dis- solved (DO)	Coli- form, Fecal	Oxygen Demand, Bio- Chemical (BOD) 5 Day	Alkalinity Total (as CaCO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ), Dis- solved	Chloride ion (Cl), Dis- solved	Solids Dis- solved (Residue @ 180 Deg C)	Sus- pended Sedi- ment
Date	Time	Micro- mhos	Units	Deg C	mg/L	Cols./ 100 mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Date	Std.	Sec.-Ft.										
Jan. 27	1055	388	1,032	8.2	15.6	11.0	< 9	---	113	214	110	598
Feb. 25	1045	2,166	1,054	8.1	16.2	8.5	< 9	---	121	211	108	598
Mar. 05	1425	965	1,100	8.4	19.0	12.0	< 9	---	119	204	108	602
Apr. 20	1330	5,476	1,090	7.9	19.3	8.5	< 9	---	128	207	113	640
May 26	1125	12,306	1,154	7.6	24.0	3.7	18	---	129	207	118	656
June 23	1055	555	1,076	7.1	25.6	3.2	70	---	134	203	117	688
July 13	1019	6,467	1,029	8.0	27.3	5.5	< 9	---	124	202	115	626
Aug. 19	1155	3,783	1,040	8.0	28.7	10.8	28	---	120	200	115	626
Sept. 16	1200	10,164	1,133	8.1	28.7	5.3	< 9	---	119	198	116	596
Oct. 26	1115	2,258	1,029	8.1	25.5	6.6	< 9	---	121	207	118	616
Nov. 30	1530	850	1,116	8.4	19.3	9.2	< 9	---	118	203	121	694
Dec. 10	1415	873	1,147	8.0	20.6	9.0	< 9	---	124	198	122	630

## QUALITY OF WATER - 1987

08-4613.00 RIO GRANDE BELOW FALCON DAM NEAR FALCON, TEXAS AND NUEVA CO. GUERRERO, TAMAULIPAS

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

DAY	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1				974	994	1,020	1,030		985	983	998	1,040
2	962	954	960									
3				974		1,040		1,000				
4		951	961		995	1,030	1,020		1,010		1,000	1,020
5	956					1,030		995		984		
6		942	958	972	1,010		1,010		974		1,000	
7	955				1,160	1,010	1,030	1,000	995		1,130	
8												1,010
9	951	950	966		1,000		1,030	1,030	987		1,040	1,000
10									985		1,000	1,010
11		961	995		1,010				981	1,000		
12	953					1,030		994			1,000	1,020
13		965	966	989	1,020		1,010				1,000	1,000
14	983							991	995	1,000		1,010
15		957		999	1,010	1,030	1,060					
16	953			968					984	990	1,000	1,030
17					981		1,070	1,020	997		1,090	1,020
18	951	957	970		1,010		1,040		979			
19						1,020		994		994		
20		955	966	993				1,000				999
21	960							991	980	1,070		1,020
22				976	1,020	1,040	1,000				997	
23	955	957	972				1,030	1,010	986	980	1,010	1,020
24					989				980			998
25		972	965									
26	957				1,020	1,030		988		1,000		1,010
27		963	971	988	1,020			986			996	1,020
28	1,060							982	983	1,000		
29	962				993	1,020	1,020	1,120				
30								984	985	999	1,000	1,090
31			975					1,030				

## 08-4645.00 RANCHERIAS DRAIN NEAR CAMARGO, TAMAULIPAS

LOCATION: At a point about 1,950 feet (600 m) from the confluence with the Rio Grande, which is located at river mile 241.6 (388.8 km). This drain carries waste water from the Lower Rio San Juan Irrigation District in Mexico.

RECORDS: Specific conductance, 1948 and 1960 through current year.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

January	March	April	June	July	September	November
6 5,180	5 5,170	21 5,630	2 2,220	29 5,110	3 4,190	4 4,900
22 5,030	19 5,290	May	18 5,720	August	17 5,050	17 4,770
February	April	6 2,330	July	5 4,920	October	December
4 5,240	2 5,480	19 5,380	3 4,690	19 4,910	2 5,000	8 5,080
18 5,140			16 5,120		16 4,950	11 5,080
					21 429	

## QUALITY OF WATER - 1987

## 08-4642.00 RIO SAN JUAN AT CAMARGO, TAMAULIPAS

LOCATION: At gaging station, 3.1 river miles (5 km) from the confluence with the Rio Grande, which is located at river mile 238.7 (384.1 km).

RECORDS: Specific conductance, 1960 through current year.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

January 6 1,890 22 1,740 February 4 2,840	February 18 2,080 March 5 2,020	March 19 2,410 April 2 1,720 21 2,450	May 19 2,270 June 2 941	June 18 1,830 July 3 1,960 16 2,400 27 2,100	August 4 1,440 18 1,080 September 16 1,720	October 2 950 December 8 1,260 16 1,360
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## 08-4647.00 RIO GRANDE AT RIO GRANDE CITY, TEXAS NEAR CAMARGO, TAMAULIPAS

LOCATION: Gaging station at river mile 235.0 (378.1 km), 3.7 river miles (6.0 km) downstream from Rio San Juan.

RECORDS: Chemical analyses, 1959 through current year; specific conductance, 1958 through current year;

suspended silt, 1959 through 1977.

REMARKS: Sampling by the International Boundary and Water Commission; chemical analyses by the U.S. Geological Survey; specific conductance determinations by the International Boundary and Water Commission.

1987 Date	Time Standard	Streamflow Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Water Temper- ature Deg C	Hardness, Total (as CaCO <sub>3</sub> ) mg/L	Hardness, Noncarbonate (as CaCO <sub>3</sub> ) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 20	1100	293	1,450	8.0	13	320	177	88	25
Feb. 18	1645	1,880	973	7.7	16.5	240	120	69	17
Mar. 13	1245	960	1,040	7.8	16	260	133	73	19
Apr. 22	1205	3,910	1,010	7.9	19	260	130	73	18
May 15	1230	4,460	1,010	7.8	24	260	130	73	18
June 15	1300	891	1,480	7.6	30	290	164	84	20
July 20	0915	2,700	1,090	7.7	31.5	270	145	75	19
Aug. 17	1130	3,160	1,000	7.8	30	240	119	68	18
Sept. 14	0900	8,140	990	7.8	28.5	240	124	67	18
Oct. 19	1000	2,750	1,020	7.7	25.5	250	133	70	19.
Nov. 16	1215	920	1,200	7.9	24	290	164	80	22
Dec. 14	1315	1,150	1,090	7.9	20	260	135	73	20

1987 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K) Dissolved mg/L	Alkalinity Total (as CaCO <sub>3</sub> ) mg/L	Sulfate ion (SO <sub>4</sub> ) Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO <sub>2</sub> ) Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 20	190	4	5.3	143	280	220	8.2	902
Feb. 18	110	3	4.8	120	210	110	11	603
Mar. 13	120	3	5.4	127	220	130	11	654
Apr. 22	110	2	5.2	130	220	120	13	637
May 15	110	2	4.9	130	200	120	12	615
June 15	200	5	5.4	126	290	230	11	916
July 20	130	3	5.4	125	220	150	13	687
Aug. 17	110	3	4.6	121	210	120	14	617
Sept. 14	110	3	1.5	116	210	120	14	610
Oct. 19	120	3	5.1	117	200	120	13	617
Nov. 16	150	3	6.5	126	240	170	11	755
Dec. 14	130	3	5.4	125	230	140	12	685

## QUALITY OF WATER - 1987

08-4647.00 RIO GRANDE AT RIO GRANDE CITY, TEXAS NEAR CAMARGO, TAMAULIPAS

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

DAY	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1				1,160	1,160	1,170	1,130		472	1,040	1,120	1,350
2	1,440	1,630	1,550	1,120	1,400	1,110	1,370		847	1,060	1,050	1,280
3					1,090	1,310		1,270				
4												
5	1,620											
6		1,250	1,240	1,210	1,100		1,120		1,140	1,120	1,520	
7	1,890											1,260
8				1,230	1,150	1,020	1,120		1,230	1,150	1,110	1,180
9	1,620	1,300	1,190		1,120	955	1,170	1,190				1,270
10												
11		1,320	1,220		1,130				1,110		1,250	1,270
12	1,640					1,580		1,190		1,110		
13		1,330	1,220	1,220	1,120		1,220		1,200	1,110	1,280	
14	1,430					1,100	1,140	1,650	1,170			1,600
15												
16	1,580	1,170	1,510	1,080		1,610	1,180	1,230	1,120	1,140	1,280	1,350
17						1,130			1,160			
18	1,260	1,430				1,970		1,190			1,300	1,310
19	1,530									1,140		
20		993	1,240	1,090	1,310		1,170				1,240	
21	1,540							1,200	1,150	1,350		1,400
22	1,660	1,170	1,120	1,160	1,160	1,930	1,220	-	1,140	1,260	1,340	1,400
23				1,100		1,790	1,240	1,200				
24						1,100				1,060		1,240
25		1,190	1,090									1,380
26	1,740					1,190	1,270	1,150			1,160	
27		1,310	1,100	1,100	1,100			1,110	1,080	1,160	1,690	1,620
28	1,760					1,130	1,150	1,130	1,490			
29									1,390	1,100	1,110	1,310
30	1,780			1,200								1,250
31												

## PUERTECITOS DRAIN AND LOS INDIOS DRAIN NEAR CO. DIAZ ORDAZ, TAMAULIPAS

LOCATION: For Puertecitos Drain, at a point about 8,500 feet (2,600 m) from the confluence with the Rio Grande, which is located at river mile 219.3 (352.9 km); and, for Los Indios Drain, at a point about 2,150 feet (650 m) from its confluence with Puertecitos Drain. These two drains join at a point about 4,250 feet (1,300 m) from the confluence with the Rio Grande. These drains carry waste water from the lower Rio San Juan Irrigation District in Mexico.

RECORDS: Specific conductance, 1960 through current year.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

Date	Puerte-citos Drain	Los Indios Drain	Date	Puerte-citos Drain	Los Indios Drain	Date	Puerte-citos Drain	Los Indios Drain	Date	Puerte-citos Drain	Los Indios Drain
Jan. 6	3,050	2,270	Apr. 2	2,870	2,270	July 3	2,470	2,590	Oct. 2	2,330	2,310
22	3,510	2,310	21	2,730	2,270	16	2,400	2,720	16	2,160	2,340
Feb. 4	3,220	2,290	May 6	1,930	1,940	29	2,590	2,450	Nov. 4	2,040	2,290
18	3,300	2,240	19	2,850	2,480	Aug. 6	2,320	2,450	17	2,410	2,400
Mar. 5	2,950	2,290	June 2	1,930	2,230	19	2,590	2,390	Dec. 10	2,690	2,150
19	3,290	2,320	18	2,870	2,610	Sep. 3	2,320	2,370	17	2,840	2,290
						17	2,350	2,440			

## QUALITY OF WATER - 1987

08-4663.00 RIO GRANDE AT LOS EBANOS, TEXAS NEAR CO. DIAZ ORDAZ, TAMAULIPAS

LOCATION: Gaging station at river mile 204.3 (328.8 km) 34.0 river miles (54.7 km) upstream from Anzalduas Dam.  
 RECORDS: Chemical analyses, June 1977 through current year; specific conductance, 1956 through current year.  
 REMARKS: Sampling by the International Boundary and Water Commission; chemical analyses by the U. S. Geological Survey; specific conductance determinations by the International Boundary and Water Commission.

1987 Date	Time Standard	Streamflow Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Water Tempera- ture Deg C	Hardness, Total (as CaCO <sub>3</sub> ) mg/L	Hardness, Noncarbonate (as CaCO <sub>3</sub> ) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 20	1330	666	2,120	8.0	13	490	306	130	39
Feb. 18	1400	2,060	1,050	7.7	16.5	250	125	72	18
Mar. 16	1400	1,680	1,320	7.7	23	320	181	89	24
Apr. 15	1030	2,300	1,040	7.9	23.5	260	132	74	19
May 18	1415	4,450	1,070	7.6	25	270	138	75	19
June 16	0915	1,990	1,350	7.6	29.5	280	155	82	19
July 20	1345	3,250	1,070	7.8	31	270	144	76	19
Aug. 18	1330	3,420	1,030	7.9	31	250	129	70	19
Sept. 14	1300	6,430	990	7.8	30	240	123	66	18
Oct. 19	1140	3,640	1,030	7.7	25.5	260	142	71	19
Nov. 17	1145	2,000	1,430	7.8	22	360	212	99	27
Dec. 16	1400	2,050	1,190	7.8	14.5	290	159	78	22

1987 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K) Dissolved mg/L	Alkalinity Total (as CaCO <sub>3</sub> ) mg/L	Sulfate ion (SO <sub>4</sub> ) Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO <sub>2</sub> ) Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 20	280	5	6.1	184	440	330	12	1,347
Feb. 18	120	3	4.6	125	240	120	11	660
Mar. 16	160	3	5.8	139	270	190	12	834
Apr. 15	120	3	5.6	128	220	130	12	657
May 18	120	3	5.8	132	210	130	12	651
June 16	170	4	6.1	125	250	210	13	825
July 20	130	3	5.3	126	230	130	14	679
Aug. 18	120	3	5.0	121	220	130	14	650
Sept. 14	110	3	5.9	117	210	120	13	613
Oct. 19	120	3	5.2	118	200	130	12	628
Nov. 17	160	3	6.6	148	290	190	13	874
Dec. 16	140	3	5.5	131	250	160	12	746

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	2,290	2,650	1,260	1,220	1,010	1,060	1,030	2,120	873	958	1,010	1,210
2	2,290	2,640	1,260	1,220	1,010	1,070	1,020	2,120	876	937	1,010	1,180
3	2,010	2,640	1,270	1,060	1,010	1,070	1,040	1,580	907	943	1,020	1,180
4	1,990	1,120	1,270	1,040	1,010	1,060	1,030	1,600	939	948	1,020	1,180
5	1,970	1,110	1,280	1,210	1,010	1,110	1,040	1,610	890	975	1,190	1,170
6	2,280	1,110	1,260	1,060	1,050	1,060	1,030	1,230	896	978	1,050	1,170
7	2,290	1,110	1,280	1,200	1,040	1,130	1,040	1,210	902	975	1,020	1,160
8	2,190	1,110	1,270	1,060	1,040	1,140	1,040	1,210	991	976	1,100	1,160
9	2,180	1,110	1,300	1,030	1,040	1,130	1,040	1,210	1,080	974	1,030	1,160
10	2,190	1,190	1,310	1,210	1,040	1,120	1,050	1,100	976	1,100	1,340	
11	2,110	1,180	1,310	1,210	1,040	1,130	1,070	1,090	1,110	974	1,130	1,370
12	2,160	1,110	1,300	1,210	1,100	1,200	1,050	1,090	1,010	1,000	1,110	1,370
13	2,170	1,110	1,300	1,210	1,120	1,490	1,050	1,030	1,010	1,000	1,110	1,370
14	2,150	1,110	1,300	1,210	1,110	1,510	1,060	1,030	997	1,000	1,360	1,370
15	2,140	1,180	1,300	1,210	1,110	1,510	1,050	1,040	997	1,000	1,370	1,380
16	2,150	1,180	1,300	1,210	1,110	1,140	1,080	1,040	1,010	1,010	1,370	1,380
17	2,160	1,180	1,310	1,080	1,110	1,540	1,080	1,040	1,010	1,010	1,370	1,370
18	1,180	1,260	1,020	1,070	1,210	1,080	1,030	1,030	1,010	1,010	1,370	1,380
19	2,020	1,060	1,240	1,010	1,060	2,120	1,080	1,030	1,330	1,010	1,370	1,380
20	2,010	1,050	1,240	1,010	1,080	1,560	1,080	1,030	1,050	1,020	1,370	1,380
21	2,010	1,050	1,240	1,000	1,060	2,110	1,080	1,030	1,040	1,020	1,190	1,210
22	1,060	1,240	1,000	1,060	2,110	1,140	1,040	972	1,020	1,120	1,210	
23	1,920	1,050	1,230	1,000	1,030	1,960	1,100	1,060	963	1,010	1,180	1,220
24	1,970	1,060	1,220	1,000	1,030	1,980	1,090	1,010	974	1,020	1,180	1,150
25	2,550	1,230	1,220	1,010	1,030	1,980	1,140	1,110	972	1,010	1,180	
26	2,580	1,240	1,220	1,010	1,030	1,990	1,140	1,110	969	1,010	1,180	1,150
27	2,580	1,250	1,220	1,000	1,030	1,990	1,130	1,050	967	1,010	1,180	1,140
28	2,580	1,280	1,220	1,000	1,030	1,090	2,130	1,110	967	1,020	1,170	1,150
29	2,640	1,220	1,000	1,040	1,040	2,120	1,110	954	1,010	1,170	1,150	
30	2,650	1,230	1,010	1,040	1,040	2,120	1,240	1,220	975	1,020	1,170	1,140
31	2,650	1,050	1,040	1,040	2,130	1,220	1,220	1,220	1,010	1,010		

## QUALITY OF WATER - 1987

## 08-4675.00 RIO GRANDE AT PENITAS, TEXAS AND REYNOSA DIAZ, TAMAULIPAS

LOCATION: At the H.C.W.C. & I. District No. 1 (Edinburg) pumping plant, river mile 186.6 (300.4 km), 16.3 river miles (26.2 km) upstream from Anzalduas Dam.

RECORDS: Specific conductance, 1963 through current year.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

January	February	April	June	July	September	November
2 2,160	25 1,170	17 1,060	9 1,320	31 1,030	21 1,100	11 1,120
5 2,070	27 1,140	20 1,030	10 1,130	August	23 1,100	13 1,190
7 1,940	March	22 1,030	12 1,280	3 1,460	25 1,030	15 1,420
9 2,190	2 1,290	24 1,030	15 1,310	5 1,880	28 1,180	18 1,490
12 2,350	4 1,570	27 1,020	17 1,560	7 1,220	30 1,100	20 1,430
14 2,310	6 1,560	29 1,010	19 1,570	10 1,160	October	23 1,370
16 2,350	9 1,400	May	22 1,510	12 1,120	2 977	25 1,250
19 2,470	11 1,390	1 1,010	24 1,690	14 1,170	5 1,010	27 1,250
21 2,400	13 1,410	4 1,010	26 1,090	17 1,030	7 957	30 1,270
23 2,360	16 1,290	6 1,000	29 1,050	18 1,050	9 983	December
26 2,380	18 1,300	8 1,030	July	21 1,050	12 1,020	2 1,220
28 2,210	20 1,290	11 1,090	1 1,040	24 1,030	14 1,010	4 1,270
30 2,190	23 1,650	13 1,070	3 1,030	26 1,070	16 1,010	7 1,410
February	25 1,240	15 1,070	6 1,050	28 1,090	19 1,020	9 1,260
2 2,240	27 1,180	18 1,050	8 1,050	30 1,070	21 1,040	11 1,240
4 2,710	30 1,300	20 1,040	10 1,070	September	23 1,040	14 1,320
6 2,710	April	22 1,060	13 1,050	2 624	26 1,030	16 1,320
9 1,360	1 1,300	25 988	15 1,090	4 380	28 1,020	18 1,220
11 1,270	3 1,270	27 1,030	17 1,080	7 914	30 1,030	21 1,320
13 1,220	6 1,060	29 1,040	20 1,070	9 1,050	November	23 1,330
16 1,290	8 1,010	June	22 1,060	11 1,090	2 1,040	25 1,370
18 1,150	10 1,180	1 1,030	24 1,080	14 1,020	4 1,030	28 1,330
20 1,070	12 1,190	3 1,100	27 1,050	16 999	6 1,060	30 1,330
23 1,130	15 1,080	5 1,090	29 1,070	18 1,010	9 1,140	

## 08-4678.00 MORILLO DRAIN NEAR ANZALDUAS DAM

LOCATION: At the Morillo Drain Project pumping plant located about 0.4 river miles (0.6 km) from the confluence with the Rio Grande or at the gaging station on the bypass canal 0.4 mile (0.6 km) from the pumping plant. Morillo Drain enters the Rio Grande at river mile 179.1 (288.3 km), 8.8 river miles (14.2 km) upstream from Anzalduas Dam. This drain carries waste water from the lower Rio San Juan Irrigation District in Mexico and surface runoff during periods of heavy precipitation.

RECORDS: Chemical analyses, 1962 through current year; specific conductance, 1956 through current year.

REMARKS: Sampling by the International Boundary and Water Commission and chemical analyses by the U. S. Geological Survey. Determinations for specific conductance by International Boundary and Water Commission.

1987	Time	# Streamflow Momentary	Specific Conductance	pH	Water Temper- ature	Hardness, Total (as CaCO <sub>3</sub> )	Hardness, Noncarbonate (as CaCO <sub>3</sub> )	Calcium ion (Ca), Dissolved	Magnesium ion (Mg), Dissolved
Date	Standard	Second-Feet	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L
Jan. 20	0930	0.8	6,090	8.0	12	870	611	210	83
Feb. 20	0830	0	7,310	7.9	15.5	1,010	746	250	93
Mar. 16	0830	0	6,840	7.8	22	920	576	210	95
Apr. 13	0720	0	4,250	8.0	22	690	486	160	68
May 20	0740	180	2,500	7.7	24	450	313	120	37
June 15	0730	750	2,320	7.6	26	360	239	100	27
July 17	0745	25	5,620	7.8	28	750	519	170	80
Aug. 17	0730	105	5,740	7.9	27	750	533	150	92
Sept. 16	0725	20	7,210	7.9	26	1,170	950	270	120
Oct. 21	1230	20	7,470	7.8	23.5	950	704	220	98
Nov. 20	0825	36	6,920	7.9	15	870	632	210	85
Dec. 16	0900	0	6,910	7.8	22	1,010	780	240	100

\* Flow to Rio Grande

1987	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio(SAR)	Potassium ion (K) Dissolved	Alkalinity Total (as CaCO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ) Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO <sub>2</sub> ) Dissolved	Solids Dissolved (Calculated)
Date	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 20	1,200	17	6.9	259	1,300	1,300	34	4,289
Feb. 20	1,400	19	6.3	264	1,500	1,600	35	5,042
Mar. 16	1,300	18	7.5	244	1,400	1,500	34	4,692
Apr. 13	750	12	6.7	194	930	910	21	2,972
May 20	410	8	7.0	137	540	490	--	1,700
June 15	360	8	6.4	121	420	450	15	1,451
July 17	1,000	15	7.7	231	1,300	960	39	3,695
Aug. 17	1,100	17	6.7	217	1,300	1,100	38	3,916
Sept. 16	1,400	17	1.9	220	1,600	1,600	44	5,167
Oct. 21	1,400	19	8.5	246	1,400	1,600	44	4,918
Nov. 20	1,300	19	7.7	238	1,400	1,400	38	4,583
Dec. 16	1,200	16	8.5	230	1,500	1,400	37	4,623

## QUALITY OF WATER - 1987

## 08-4678.00 MORILLO DRAIN NEAR ANZALDUAS DAM

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

January	March	April	June	August	September	November
2 3,730	2 7,350	27 3,760	15 2,330	6 6,470	26 2,950	8 6,910
6 4,560	5 7,630	May 18	6,380	11 5,460	30 4,590	12 5,870
8 4,770	9 7,480	4 4,400	22 7,520	13 6,010	October	16 6,510
12 4,460	12 7,320	7 3,050	25 6,880	17 6,040	1 5,770	19 6,610
15 4,380	16 7,250	11 4,930	29 5,040	20 6,750	5 6,760	20 6,840
19 6,300	19 7,480	14 6,090	July 24	27 7,080	8 7,270	23 6,920
22 6,590	23 7,310	18 5,970	3 4,490	27 7,070	13 7,210	26 7,250
26 7,190	26 7,510	20 2,600	6 4,730	31 7,030	15 7,380	30 7,120
29 7,050	30 7,250	21 3,260	9 4,690	September 19	7,430	December
February	April 25	6,090	13 5,410	3 5,640	20 7,430	3 6,990
2 7,270	2 7,460	28 4,930	16 5,820	7 6,480	21 7,180	9 6,610
6 7,130	6 6,620	June 17	5,620	10 7,080	23 5,200	10 6,940
9 7,100	9 5,170	1 1,370	20 6,470	14 7,270	26 7,100	14 6,880
12 7,400	13 4,430	2 1,570	23 6,550	16 7,210	29 7,240	17 6,070
16 7,190	16 3,990	4 4,200	29 6,040	21 3,680	November 21	21 7,340
19 7,010	20 4,590	8 1,830	August 22	22 4,360	3 6,860	24 6,590
23 7,210	23 4,560	11 3,300	3 6,670	24 4,360	4 7,390	27 4,300
26 7,460				25 5,990	6 6,910	31 4,450

## 08-4692.00 RIO GRANDE BELOW ANZALDUAS DAM NEAR REYNOSA, TAMAULIPAS AND MISSION, TEXAS

LOCATION: At Anzalduas Dam, 0.5 river mile (0.8 km) above the gaging station, located at river mile 169.8 (273.3 km).

RECORDS: Chemical analyses, March 1959 through current year; specific conductance 1948 and 1956 through current year; suspended silt, May 1956 through 1977.

REMARKS: Sampling by the International Boundary and Water Commission; chemical analyses by the U. S. Geological Survey; determinations for specific conductance by the International Boundary and Water Commission.

1987	Time	Streamflow Momentary	Specific Conductance	pH	Water Temper- ature	Hardness, Total (as CaCO <sub>3</sub> )	Hardness, Noncarbonate (as CaCO <sub>3</sub> )	Calcium ion (Ca), Dissolved	Magnesium ion (Mg), Dissolved
Date	Standard	Second-Feet	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L
Jan. 20	1030	200	2,940	8.0	11	550	368	150	43
Feb. 20	0915	810	1,260	7.9	13	290	157	80	21
Mar. 16	0850	150	1,760	7.9	19	410	248	110	32
Apr. 13	0740	600	1,260	8.0	23	280	149	79	19
May 20	0815	600	1,250	7.9	20	280	147	78	20
June 15	0740	776	1,570	7.8	28	310	179	88	21
July 17	0800	2,000	1,250	7.9	26.5	280	149	79	21
Aug. 17	0745	1,740	1,110	8.0	29	260	135	72	20
Sept. 16	0745	6,760	1,130	7.9	26	250	132	70	19
Oct. 21	0920	2,010	1,120	7.9	22	280	159	77	21
Nov. 20	0840	400	1,420	8.0	19	360	219	100	27
Dec. 14	1000	650	1,320	8.0	21	320	182	85	25

1987	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio(SAR)	Potassium ion (K) Dissolved	Alkalinity Total (as CaCO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ) Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO <sub>2</sub> ) Dissolved	Solids Dissolved (Calculated)
Date	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 20	420	7	6.1	182	590	500	14	1,832
Feb. 20	140	3	4.9	133	250	160	11	746
Mar. 16	230	4	5.8	162	350	300	2	1,127
Apr. 13	140	3	5.3	131	240	150	13	724
May 20	140	3	4.8	133	250	150	13	735
June 15	210	5	5.5	131	300	250	14	967
July 17	140	3	5.3	131	240	150	14	727
Aug. 17	130	3	4.8	125	230	140	13	684
Sept. 16	130	3	5.8	118	220	130	14	659
Oct. 21	130	3	5.1	121	220	150	13	688
Nov. 20	160	3	5.8	141	280	190	12	859
Dec. 14	150	3	5.7	138	250	190	12	800

## QUALITY OF WATER - 1987

08-4692.00 RIO GRANDE BELOW ANZALDUAS DAM NEAR REYNOSA, TAMAULIPAS AND MISSION, TEXAS

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

DAY	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,590	2,610	1,160	1,230	1,030	1,090	1,110	1,250	1,130	1,140	1,060	1,230
2	1,750	2,590	1,180	1,250	1,040	1,100	1,100	1,280	1,100	1,170	1,120	1,310
3	2,040	2,560	1,180	1,250	1,040	1,140	1,110	1,350	659	1,110	1,130	1,280
4	2,090	2,560	1,170	1,380	1,070	1,140	1,100	1,340	593	1,090	1,140	1,350
5	2,140	2,460	1,190	1,360	1,040	1,140	1,100	1,340	498	1,060	1,140	1,250
6	2,310	2,350	1,180	1,300	1,080	1,150	1,100	1,340	368	1,100	1,160	1,230
7	2,330	2,380	1,230	1,140	1,070	1,180	1,140	1,350	447	1,110	1,190	1,310
8	2,360	2,550	1,810	1,060	1,100	1,180	1,140	1,750	658	1,090	1,240	1,340
9	2,390	2,660	1,590	1,170	1,090	1,170	1,130	1,880	744	1,040	1,230	1,570
10	2,370	2,930	1,690	1,240	1,130	1,210	1,120	1,530	925	1,060	1,130	1,460
11	2,430	2,310	1,710	1,140	1,230	1,420	1,140	1,340	884	1,050	1,130	1,420
12	2,460	1,940	1,760	1,100	1,160	1,540	1,170	1,260	1,090	1,060	1,120	1,390
13	2,470	1,450	1,880	1,140	1,110	1,550	1,150	1,150	1,010	1,070	1,120	1,340
14	2,350	1,320	1,910	1,210	1,090	1,540	1,170	1,150	1,010	1,070	1,110	1,290
15	2,160	1,260	1,850	1,050	1,080	1,550	1,140	1,200	1,000	1,080	1,120	1,290
16	2,160	1,240	1,830	1,030	1,100	1,540	1,140	1,220	1,557	1,100	1,150	1,270
17	2,190	1,270	1,760	1,020	1,080	2,120	1,140	1,110	1,050	1,110	1,180	1,280
18	2,240	1,330	1,650	1,040	1,060	1,860	1,150	1,060	1,110	1,110	1,270	1,280
19	2,580	1,280	1,570	1,090	1,120	1,720	1,440	1,060	1,110	1,090	1,300	1,310
20	2,680	1,210	1,520	1,110	1,100	1,730	1,400	1,060	1,130	1,130	1,360	1,320
21	2,790	1,160	1,510	1,120	1,100	1,720	1,350	1,070	1,110	1,120	1,400	1,310
22	2,810	1,130	1,500	1,040	1,060	1,720	1,330	1,080	1,220	1,120	1,430	1,270
23	2,830	1,100	1,480	1,040	1,100	1,760	1,310	1,070	1,100	1,140	1,510	1,260
24	2,830	1,080	1,420	1,040	1,080	1,880	1,320	1,050	1,110	1,110	1,450	1,240
25	2,810	1,070	1,400	1,050	1,060	1,970	1,140	1,050	1,150	1,110	1,560	1,250
26	2,840	1,060	1,490	1,030	1,050	2,140	1,190	1,050	1,080	1,120	1,390	1,310
27	2,820	1,080	1,760	1,040	1,030	2,380	1,160	1,050	1,050	1,120	1,350	1,360
28	2,840	1,120	1,550	1,050	1,050	1,200	1,190	1,050	1,090	1,130	1,270	1,450
29	2,790	1,380	1,060	1,060	1,110	1,510	1,090	1,210	1,130	1,250	1,300	1,300
30	2,690	1,280	1,050	1,070	1,100	1,320	1,110	1,090	1,130	1,240	1,390	1,650
31	2,610	1,220			1,080	1,290	1,130			1,130		

## 08-4733.90 RIO GRANDE AT MERCEDES IRRIGATION DISTRICT PUMPS NEAR MERCEDES, TEXAS AND RIO RICO, TAMAULIPAS

LOCATION: At river mile 117.8 (189.5 km), 52.6 river miles (84.6 km) downstream from Anzalduas Dam.

RECORDS: Specific conductance, 1945 through current year.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

DAY	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,590	2,950	1,210	1,610	1,100	1,160	1,150	1,410	1,120	1,100	1,110	1,330
2	1,750	3,000	1,190	1,440	1,060	1,160	1,160	1,480	1,150	1,170	1,140	1,330
3	1,720	2,910	1,240	1,330	1,060	1,160	1,160	1,530	1,010	1,130	1,140	1,360
4	1,710	2,840	1,290	1,310	1,040	1,160	1,140	1,560	914	1,120	1,140	1,310
5	1,720	2,810	1,360	1,310	1,060	1,200	1,130	1,640	730	1,120	1,150	1,400
6	1,800	2,780	1,370	1,310	1,080	1,240	1,130	1,550	718	1,120	1,150	1,390
7	1,780	2,780	1,370	1,420	1,020	1,280	1,130	1,460	620	1,090	1,170	1,470
8	1,930	2,780	1,310	1,420	1,080	1,290	1,110	1,510	512	1,110	1,190	1,430
9	2,160	2,730	1,310	1,250	1,170	1,250	1,120	1,520	463	1,100	1,220	1,350
10	2,200	2,500	1,310	1,150	1,160	1,240	1,120	1,530	597	1,140	1,260	1,340
11	2,210	2,480	1,320	1,180	1,160	1,450	1,120	1,600	787	1,060	1,240	1,380
12	2,200	2,510	1,430	1,190	1,200	1,460	1,130	1,660	860	1,060	1,170	1,450
13	2,260	2,770	1,610	1,180	1,240	1,460	1,140	1,520	1,130	1,080	1,170	1,600
14	2,380	2,320	1,830	1,260	1,280	1,470	1,170	1,380	1,040	1,100	1,210	1,620
15	2,400	1,770	1,820	1,260	1,290	1,480	1,170	1,250	1,020	1,110	1,260	1,570
16	2,370	1,430	1,820	1,170	1,450	1,610	1,150	1,230	1,010	1,110	1,250	1,530
17	2,340	1,360	1,830	1,200	1,460	1,620	1,140	1,190	1,020	1,130	1,340	1,470
18	2,350	1,320	1,850	1,260	1,460	1,650	1,160	1,170	1,050	1,130	1,300	1,420
19	2,350	1,360	1,910	1,220	1,420	1,790	1,140	1,120	1,060	1,130	1,300	1,400
20	2,330	1,350	2,030	1,220	1,450	1,840	1,170	1,110	1,050	1,130	1,320	1,390
21	2,370	1,370	2,130	1,160	1,300	1,920	1,190	1,090	1,110	1,140	1,310	1,400
22	2,300	1,310	2,020	1,150	1,200	2,030	1,200	1,100	1,140	1,140	1,420	1,430
23	2,230	1,310	1,850	1,150	1,250	2,050	1,270	1,100	1,110	1,150	1,580	1,420
24	2,420	1,290	1,720	1,070	1,140	2,050	1,300	1,110	1,140	1,140	1,520	1,420
25	2,440	1,260	1,600	1,070	1,180	1,980	1,320	1,090	1,090	1,160	1,510	1,400
26	2,420	1,290	1,570	1,060	1,110	1,440	1,160	1,100	1,110	1,150	1,580	1,400
27	2,470	1,280	1,530	1,070	1,080	1,610	1,280	1,110	1,100	1,140	1,570	1,480
28	2,510	1,200	1,540	1,060	1,070	1,310	1,190	1,110	1,030	1,140	1,530	1,340
29	2,680	1,540	1,070	1,040	1,310	1,300	1,090	1,050	1,180	1,600	1,380	
30	2,840	1,540	1,080	1,070	1,210	1,310	1,080	1,090	1,140	1,440	1,450	
31	2,990	1,920		1,070	1,070	1,320	1,110			1,140		1,470

## QUALITY OF WATER - 1987

## 08-4750.00 RIO GRANDE NEAR BROWNSVILLE, TEXAS AND MATAMOROS, TAMAULIPAS

LOCATION: Gaging station at river mile 48.7 (78.3 km), 0.2 river mile (0.3 km) downstream from El Jardin pumping plant and 7.0 river miles (11.2 km) downstream from the international highway bridge between Brownsville, Texas and Matamoros, Tamaulipas.

RECORDS: Chemical and biochemical analyses, October 1967 through January 1968 and October 1974 through current year; biochemical, December 1976 through current year; specific conductance, 1955 through September 1983; suspended silt, 1955 through 1977.

REMARKS: Sampling and analyses by the U. S. Geological Survey. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, determined and published by the U. S. Geological Survey. Sampling and determinations for specific conductance prior to 1978 by the International Boundary and Water Commission.

1987 Date	Time Std. Sec.-Ft.	Stream flow, Momen- tary Micromhos	Specific Conduct- ance pH	Water Temper- ature Units	Hard- ness, Total (as CaCO <sub>3</sub> ) mg/L	Hard- ness, Noncar- bonate (as CaCO <sub>3</sub> ) mg/L	Calcium ion (Ca), Dis- solved mg/L	Magne- sium ion (Mg) mg/L	Sodium ion (Na), Dis- solved mg/L	Sodium Adsorp- tion Ratio (SAR)	Potassium ion (K), Dissolved mg/L
Jan. 14	0900	92	1,900	8.1	14.5	470	265	130	36	220	4
Mar. 10	1028	33	1,480	8.4	20.8	360	200	100	28	170	3
May 12	0930	460	1,100	8.8	24	250	126	72	18	130	3
July 7	0830	243	2,340	8.1	29.5	480	255	130	38	280	5
Sept. 1	1410	199	1,080	8.1	28.5	290	172	79	22	130	3
Nov. 19	1500	354	1,200	8.3	22	320	177	90	24	130	3

1987 Date	Alka- linity Total (as CaCO <sub>3</sub> ) mg/L	Sulfate ion (SO <sub>4</sub> ), Dis- solved mg/L	Chlo- ride ion (Cl), Dis- solved mg/L	Silica (SiO <sub>2</sub> ), Dis- solved mg/L	Oxygen, Dis- solved (DO) mg/L	Coli- form, Fecal Cola./ 100 mL	Oxygen Demand, Bio- Chemical (BOD) 5 Day mg/L	Tur- bidity NTU	Solids Dis- solved (Calcu- lated) mg/L	Solids Dis- solved (Residue @ 180 Deg C) mg/L	Sus- pended Sedi- ment mg/L
Jan. 14	205	350	290	13	9.5	400	3.6	17.0	1,168	1,170	65
Mar. 10	160	290	210	14	12.0	130B	3.8	8.6	913	913	46
May 12	124	230	140	12	6.4	130B	1.7	38.0	681	690	78
July 7	195	420	360	21	7.4	120B	2.4	25.0	1,373	1,430	45
Sept. 1	118	230	150	16	7.8	920B	1.4	26.0	703	734	55
Nov. 19	143	250	150	15	9.0	120	3.0	17.0	750	791	40

B Results based on colony count outside acceptance range (non-ideal colony count)

RAINFALL ON THE RIO GRANDE WATERSHED  
IN THE UNITED STATES  
IN INCHES

Tabulated below, in approximate downstream order, are monthly records of United States rainfall stations with averages for their periods of record. With the exception of Las Cruces, New Mexico, all stations are located in Texas. For location, elevation, period of record, type of gage in use, watershed subdivision in which the station is located, and the observer, see alphabetical listing of these stations following rainfall data in this bulletin. These rainfall records have not been published elsewhere. Records of daily rainfall amounts, where available, are on file in the office of the United States Section of the Commission. Daily records for years prior to 1953 may also be found in corresponding water bulletins.

Detailed listings of the months and years for which records are available through 1970 may be found under "Index to Precipitation Records" in Water Bulletins 10, 14, 26, and Supplement 40A.

Month	Las Cruces, New Mexico		American Dam		Fort Hancock Bridge		Guayucco Arroyo		Neely Ranch	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.26	0.70	0.11	0.41	0.08	0.40	0	0.32	0.09	0.34
Feb.	.40	.40	.21	.37	0	.31	0	.20	.64	.22
Mar.	.05	.21	.23	.31	.24	.27	.16	.23	.15	.19
Apr.	.24	.31	.10	.22	.05	.28	.30	.19	.47	.18
May	.22	.56	.11	.27	1.16	.47	1.41	.44	2.63	.39
June	1.21	.93	1.88	.65	.22	.88	.35	.63	.68	.88
July	.54	1.03	.11	1.49	.66	1.25	.76	1.30	1.34	1.67
Aug.	5.46	2.85	3.06	1.50	.99	1.57	.29	1.61	1.77	1.77
Sep.	.57	1.33	.71	1.12	.87	1.42	.23	1.22	.64	1.56
Oct.	.27	1.13	.14	.81	.62	1.00	.65	.95	.82	1.05
Nov.	.23	.86	.36	.32	.62	.38	.39	.27	.05	.32
Dec.	1.43	.88	.53	.46	1.32	.48	.43	.37	1.21	.46
Yearly	10.88	11.19	7.55	7.93	6.83	8.71	4.97	7.73	10.49	9.03

Month	La Macolla Farm		Adobes Ranch		Shafter		Presidio (IB&WC Gage)		Kerr Mitchell Ranch	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0	0.30	0.01	0.37	0	0.22	0	0.33	0.10	0.52
Feb.	.08	.40	.10	.24	0	.36	.30	.21	.50	.35
Mar.	0	.11	0	.17	.50	.36	.01	.16	0	.20
Apr.	2.22	.68	2.20	.19	3.18	.90	1.45	.28	3.95	.51
May	2.08	.93	.90	.70	1.13	.93	.77	.58	1.55	1.20
June	4.64	2.17	2.60	1.46	4.61	2.90	3.59	1.42	.85	1.98
July	2.84	1.44	1.10	1.99	1.14	3.15	2.35	1.48	3.00	2.06
Aug.	2.21	2.85	3.50	1.90	1.15	2.97	1.57	1.40	1.80	2.27
Sep.	.58	2.41	1.90	2.31	1.96	3.56	1.48	1.54	.22	2.15
Oct.	.65	1.22	.50	.80	1.60	1.66	.27	.83	.15	1.41
Nov.	0	.29	0	.29	0	.43	0	.33	0	.39
Dec.	0	.47	.10	.33	0	.51	.65	.38	.15	.45
Yearly	15.30	13.27	12.91	10.75	15.27	17.95	12.44	8.94	12.27	13.49

Month	H. T. Fletcher Ranch		La Mota Ranch		Redford		Study Butte		Terlingua Creek Station		
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average	
Jan.	0.10	0.69	0.20	0.67			0.32	0.27	0.56	0.01	0.31
Feb.	.45	.35	.20	.12			.21	0	.17	0	.21
Mar.	1	.34	.05	.26			.18	0	.08		.13
Apr.	2.80	.47	2.60	.73			.30	1.65	.57		.35
May	1.25	1.11	2.10	1.06	5.00	.64	1.22	1.40	2.10		.73
June	1.65	1.90	1.00	1.92	.60	1.10	.11	1.55	.90		1.15
July	1.70	2.89	2.60	1.20	2.00	1.41	3.68	1.72	3.00		1.25
Aug.	2.25	3.21	5.20	1.95	1.80	1.35	2.42	1.78	2.70		1.22
Sep.	.35	2.58	1.20	2.33	.90	1.89	1.10	1.37	1.00		1.26
Oct.	.80	1.52		1.17	.40	.93	.74	1.25	.20		.84
Nov.		.47		.45	0	.37	0	.34	0		.25
Dec.	.25	.48		.43	.20	.32	0	.32	.10		.27
Yearly		16.01		12.29			9.02	11.19	11.11		7.97

T Trace

## RAINFALL ON THE RIO GRANDE WATERSHED

IN THE UNITED STATES

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Month	Johnson Ranch		Yarborough Ranch		Lewis James Ranch		Bricker Ranch		Ross Foster Ranch	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0	0.32	0.01	0.28	0	0.52	0.52	0.35	0	0.41
Feb.	.02	.22	.63	.42	1.70	.59	2.95	.71	.60	.50
Mar.	T	.16	1.77	.38	.22	.32	.86	.47	0	.26
Apr.	1.70	.43	1.11	.34	3.06	1.19	2.23	1.01	.97	.90
May	1.50	.99	2.08	1.04	3.16	1.69	2.43	1.27	1.85	1.26
June	.20	1.15	1.69	2.22	1.17	1.33	1.78	1.31	2.80	1.36
July	.60	1.15	2.26	2.54	2.41	1.28	.76	.72	.65	.59
Aug.	2.50	.96	1.92	2.68	2.92	1.99	1.24	1.02	2.40	1.28
Sep.	1.30	1.38	3.42	3.24	3.60	2.89	4.66	2.22	2.10	1.62
Oct.	.40	.76	.99	1.76	.34	1.68	.07	1.08	.20	1.16
Nov.	0	.24	0	.57	.27	.78	0	.38	.40	.52
Dec.	.40	.32	.79	.58	.95	.54	.90	.39	.32	.51
Yearly	8.62	8.08	16.67	16.05	19.80	14.80	18.40	10.93	12.29	10.37

Month	Owens Ranch		Prosser Ranch No. 3		Ranchita (Continental)		Rio Grande near Dryden		Pecos River near Langtry Station	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.07	0.47	0.10	0.41	0	0.58	0	0.71	0.10	0.41
Feb.	2.19	.71	4.38	.95	3.00	.78	0	.28	1.64	.77
Mar.	1.31	.96	1.25	.58	.80	.59	0	.15	.30	.46
Apr.	1.76	1.85	1.00	1.32	1.20	1.33	1.85	.91	.60	.98
May	3.39	2.13	3.50	2.26	4.10	2.23	1.65	1.19	3.25	1.41
June	3.80	2.17	3.70	1.73		2.15	2.28	1.47	3.55	2.19
July	.17	1.02	1.00	1.34		1.54	.47	.62	.50	1.41
Aug.	2.61	2.09	3.70	2.05		2.30	1.24	1.88	3.95	1.58
Sep.	.74	2.25	2.25	3.13		2.54	2.30	1.96	1.20	2.16
Oct.	.95	2.51	.50	2.14		2.42	.15	1.12	0	1.72
Nov.	.20	1.26	.10	.69		.71	.17	.65	.30	.76
Dec.	1.45	.67	.45	.57		.68	.53	.56	.30	.54
Yearly	18.64	18.09	21.93	17.17		17.85	10.64	11.50	15.69	14.39

Month	Dead Man's Canyon near Comstock		Prosser Ranch No. 1		Continental Ranch		Martin King Ranch		Brotherton Ranch	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0	0.49	0.10	0.40	0	0.65	0.12	0.53	0	0.61
Feb.	1.40	.70	1.60	.75	2.40	.86	1.37	.73	3.54	.93
Mar.	.60	.55	.80	.49	1.30	.65	.45	.33	.70	.52
Apr.	1.40	1.20	1.20	1.28	1.50	1.53	1.31	.97	1.63	.99
May	4.40	2.15	3.40	2.32	4.30	2.94	4.16	1.68	4.26	1.75
June	4.50	2.36	2.45	1.86		2.18	4.80	1.85	4.45	1.95
July	.65	2.07	.80	1.80		2.27	1.92	1.45	1.74	1.52
Aug.	3.05	1.74	2.70	1.92		2.27	6.00	1.59	2.96	1.75
Sep.	2.00	2.46	1.70	2.69		3.45	1.20	2.42	2.69	2.46
Oct.	0	1.91	.60	2.02		2.61	0	2.14	0	1.84
Nov.	.60	.81	.80	.80		.73	.46	.62	.33	.61
Dec.	.70	.62	.70	.53		.67	.58	.55	.61	.46
Yearly	19.30	17.06	16.85	16.86		20.80	22.37	14.86	22.91	15.39

Month	Walker Ranch		Zuberbueler Ranch		P. W. Kelly Ranch		Comstock		Cow Creek near Comstock	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.20	0.42	0.13	0.52		0.58	0.15	0.57	0.10	0.31
Feb.	1.50	.73	2.01	.94	1.60	.86	2.10	.81	0	.44
Mar.	.40	.46	.66	.45		.67	.77	.58	.50	.40
Apr.	1.35	1.09	1.80	1.12		1.10	1.75	1.34	2.10	1.14
May	3.70	2.52	1.85	2.15	3.20	2.28	2.42	1.91	6.00	1.38
June	3.85	2.46	4.25	2.53	1.93	2.32	4.04	2.23	1.60	1.42
July	.60	1.42	2.10	2.25	0	1.82	2.28	1.41	1.65	1.51
Aug.	3.80	1.25	1.58	1.03	3.52	1.91	1.06	1.70	1.00	1.72
Sep.	1.90	3.07	1.94	2.40	2.46	2.99	1.53	2.35	.11	2.20
Oct.	T	1.81	.04	1.71	0	1.88	.05	1.85	0	1.62
Nov.	.40	.86	.32	.87		.88	.75	.66	1.20	.76
Dec.	.75	.57	.94	.85		.36	.65	.66		.55
Yearly	18.45	16.66	17.62	16.82		17.65	17.55	16.07		13.45

T Trace

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Month	Amistad Reservoir near Comstock		Feeley		Line Store		W. E. Sawyer Ranch		Prosser Ranch No. 2	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0	0.38			0.30	0.96	0.37	0.49	0.15	0.38
Feb.	1.70	.60	.70	.73	2.79	1.05	2.93	1.00	3.50	.97
Mar.	0	.39	.10	.46	1.49	.82	1.58	1.03	1.20	.60
Apr.	0	1.26	1.70	1.33	3.39	1.85	2.50	1.82	.90	1.32
May		1.41	4.10	1.92	7.30	2.55	5.15	2.59	4.10	2.41
June	1.50	1.73	2.65	2.02	3.45	2.06	4.81	2.15	3.00	1.91
July	2.28	1.24		1.37	.87	1.98	1.67	1.86	1.20	1.64
Aug.		1.53		1.81	1.75	2.42	2.13	2.75	3.20	2.24
Sep.	.10	1.74		2.08	1.93	3.29	2.87	3.02	1.50	2.94
Oct.	.30	1.96		1.82	.49	2.37	.30	2.65	.20	1.96
Nov.	.90	.69		.61	.29	.93	0	.93	.20	.74
Dec.	0	.32		.45	1.16	.66	1.20	.82	.30	.50
Yearly		13.25		14.97	25.21	20.94	25.51	21.11	19.45	17.61

Month	Devils River at Cauthorn Ranch		Bakers Crossing		Vinegarone		Eugene Miller Ranch		H. K. Fawcett Ranch	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.15	0.39	0.22	0.64	0	0.59	0.17	0.61	0.04	0.65
Feb.	2.40	.77	2.05	.98	2.05	.87	2.62	.68	1.90	.76
Mar.	1.74	.63	1.00	.70	.25	.67	1.31	.72	0	.73
Apr.	1.35	1.02	1.47	1.26	2.40	1.54	2.21	1.54	4.14	1.67
May	2.17	2.44	1.74	2.50	6.50	2.81	4.75	3.35	.91	2.41
June	5.93	2.35	4.74	2.26	4.60	2.40	2.64	2.19	1.57	1.62
July	2.70	.79	1.57	1.60	7.92	2.25	.85	2.38	.36	1.58
Aug.	2.79	1.23	2.28	2.10	4.50	2.75	2.11	2.14	6.63	2.32
Sep.	.09	1.37	1.33	3.33	.05	2.43	2.20	2.69	1.09	2.82
Oct.	1.70	3.01		2.28	0	2.84	T	2.88	0	2.49
Nov.	.34	.64	.92	.59	0	1.01	.26	.95	.65	.85
Dec.	.58	.63	.78	.65	.70	.73	.80	.71	.55	.58
Yearly	21.94	15.27		18.89	28.97	20.89	19.92	20.84	17.84	18.48

Month	Ed Crane Ranch		H. T. Miers Ranch Headquarters		H. T. Miers Ranch No. 2		A. A. Baker Ranch		Harlow Ranch	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.19	0.77	0	0.60	0.10	0.48	0.05	0.44	0	0.37
Feb.	1.47	1.00	1.65	1.01	1.58	.85	1.65	.73	1.50	.59
Mar.	.48	.55	.32	.72	.50	.83	.53	.53	.60	.34
Apr.	1.89	1.56	2.40	1.73	2.75	1.57	1.53	1.20	1.45	1.13
May	2.61	2.54	2.50	2.57	3.73	2.51	2.60	1.91	2.40	2.00
June	3.72	2.26	6.95	2.79	6.45	2.34	4.27	2.02	5.90	2.47
July	.73	1.70	1.50	1.61	1.07	1.45	1.63	1.50	1.30	1.28
Aug.	2.83	1.14	2.80	1.87	1.89	2.25	1.25	1.69	2.85	1.69
Sep.	2.46	2.66	.40	2.46	.71	2.58	1.61	2.87	2.05	2.47
Oct.	1.21	2.27	0	2.77	0	2.35	0	1.90	0	2.03
Nov.	.53	.88	1.15	.95	.45	1.02	.55	.70	.25	.66
Dec.	1.08	.81	.80	.66	.85	.74	.70	.51	.75	.53
Yearly	19.20	18.14	20.47	19.74	20.08	18.97	16.37	16.00	19.05	15.56

Month	Gillis Ranch		Goldwire Ranch		Pafford Crossing		Big Satan Creek Station		Cliff Lowry Ranch No. 1	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.24	0.47	0	0.58	0	0.54	0	0.61	0.11	0.52
Feb.	1.93	.93	1.55	.69	2.05	.76	2.05	.69	2.22	1.02
Mar.	.93	.74	.65	.70	.85	.54	.63	.82	.73	.78
Apr.	2.07	1.59	2.50	1.62	3.40	1.32	3.70	1.68	2.02	1.67
May	5.15	2.41	3.80	2.57	3.10	2.01	4.00	2.42	3.75	2.53
June	6.52	2.42	5.10	2.28	7.90	2.32	6.00	2.32	6.01	2.45
July	1.53	1.72	1.50	2.18	2.75	1.87	1.90	2.18	1.27	1.68
Aug.	1.18	1.56	2.00	2.63	.90	1.04	.90	2.55	1.69	2.14
Sep.	1.17	2.71	1.60	2.40	1.60	2.84	1.80	2.32	.16	2.92
Oct.	0	2.11	0	2.41	0	2.23	0	2.52	.05	2.40
Nov.	1.49	.89	2.05	1.14	.95	.87	1.30	1.12	1.21	1.05
Dec.	.75	.67	.75	.65	.70	.59	0	.71	.62	.65
Yearly	22.96	18.22	21.50	19.85	24.20	17.83	22.28	19.94	19.84	19.81

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Month	Lowry Ranch No. 2		Tuffy Whitehead Ranch		Stewart Ranch		Rough Canyon near Del Rio		Devils Lake	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.06	0.45	0	0.41	0.08	0.49	0.02	0.41	0.13	0.62
Feb.	.56	.80	1.79	.76	2.36	.89	2.61	.92	2.12	.83
Mar.	.39	.73	1.40	.62	.63	.64	.64	.65	.34	.59
Apr.	2.40	1.59	2.08	1.30	1.93	1.59	2.66	1.43	2.61	1.59
May	1.42	2.16	2.99	1.82	1.93	1.91	3.50	2.33	3.85	2.04
June	6.05	2.39	3.54	2.01	5.92	2.45	6.10	2.54	6.30	2.49
July	1.91	1.80	1.50	1.42	2.20	1.66	2.30	1.93	.80	1.33
Aug.	1.39	2.21	.77	1.49	.95	1.67	1.30	2.05	.98	1.68
Sep.	1.15	2.26	1.72	2.60	.52	2.37	1.50	2.31	1.35	2.28
Oct.	.10	2.23	0	1.83	0	2.23	0	2.66	0	2.04
Nov.	.92	.99	.65	.68	2.00	.90	2.00	1.04	1.00	.77
Dec.	.41	.67	.45	.53	.35	.61	.60	.71	.77	.74
Yearly	16.76	18.28	16.89	15.47	18.87	17.41	23.23	18.98	20.25	17.00

Month	Sellers Ranch		Evans Creek near Comstock		J. G. Brite Ranch		Hutto Ranch No. 1		Hutto Ranch No. 2	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.10	0.38	0	0.31	0	0.41	0.13	0.55	0.09	0.55
Feb.	1.60	.74	2.00	.80	1.75	.85	2.67	.91	3.07	.99
Mar.	.45	.48	.30	.52	.49	.63	.78	.68	.96	.68
Apr.	2.15	1.29	2.45	1.19	2.02	1.45	2.09	1.83	1.74	1.90
May	3.25	1.88	3.10	1.75	3.47	2.13	2.37	2.21	3.92	1.98
June	3.30	2.60	2.60	2.09	5.12	2.38	4.80	2.52	6.49	2.57
July	.90	1.24	1.00	1.66	1.09	1.49	.49	1.86	1.26	1.89
Aug.	1.00	1.63	.70	2.14	1.14	1.92	2.25	1.87	3.08	1.97
Sep.	1.15	2.32	1.50	2.54	2.44	2.97	.59	2.50	1.60	3.06
Oct.	0	2.09	0	2.11	.05	2.19	.04	2.38	.05	2.23
Nov.	.30	.72	.80	.88	.95	.79	.46	.87	.57	.98
Dec.	.40	.54	.36	.52	.40	.59	.23	.63	.77	.60
Yearly	14.60	15.91	14.81	16.51	18.92	17.80	16.90	18.81	23.60	19.40

Month	Middle Fork San Pedro		North Fork San Pedro		Long Ranch		Buoy No. 11		Amistad Dam	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.01	0.48	0.01	0.46	0.14	0.56	0	0.43	0.14	0.53
Feb.	3.19	.99	2.81	.83	3.43	.89	1.40	.65	2.56	.88
Mar.	.59	.71	0	.67	1.33	.71	.30	.43	1.47	.71
Apr.	2.61	1.70	2.60	1.71	2.33	1.60	2.50	1.66	2.67	1.78
May	4.17	2.41	4.95	2.34	4.17	2.34	7.13	2.03	5.28	2.24
June	5.25	2.74	5.80	2.65	6.22	2.71	1.50	2.30	5.61	2.41
July	.30	2.25	1.10	2.23	1.63	1.96	1.95	1.59	2.70	1.77
Aug.	2.40	1.98	1.60	1.96	2.98	1.58	.73	1.66	2.40	2.04
Sep.	.60	1.65	.90	1.90	0	1.91	.58	2.16	1.81	3.24
Oct.	0	2.77	0	2.57	.06	2.22	0	1.78	.25	2.10
Nov.	.60	1.02	1.40	1.06	.59	.91	.70	.64	.58	.91
Dec.	.40	.70	.40	.71	.66	.69	.30	.34	.72	.68
Yearly	20.12	19.40	21.57	19.09	23.54	18.08	17.09	15.67	26.19	19.29

Month	Laughlin Air Force Base		Gillis Headquarters Ranch		Lewis Ranch		Maverick County Canal Headgate		Wardlaw Standard Ranch	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.27	0.19	0.15	0.68	0	0.59	0.35	0.57	0.20	0.83
Feb.	3.42	1.00	2.48	1.04	.80	1.15	2.10	.95	2.63	1.17
Mar.	.80	.58	.73	.84	1.50	.82	.10	.56	.68	1.01
Apr.	2.33	2.08	3.27	1.89	1.65	2.06	2.50	1.64	1.58	1.60
May	6.69	2.17	5.24	2.91	2.75	2.56	4.60	2.19	11.28	3.08
June	5.29	2.98	7.09	2.97	7.55	3.11	5.90	2.34	4.03	3.29
July	1.05	2.34	2.25	2.14	.90	1.44	1.50	1.72	1.13	.90
Aug.	3.62	1.83	1.55	2.47	2.35	2.06	2.50	1.49	2.90	.85
Sep.	.62	2.33	.43	1.94	.55	2.67	.18	2.56	.60	2.03
Oct.	.76	2.54	T	2.85	0	2.92	0	2.24	0	2.34
Nov.	.79	1.06	3.12	1.36	.70	1.21	.40	.99	.88	1.80
Dec.	1.04	.53	.78	.87	.55	.82	1.18	.70	.92	.86
Yearly	26.68	19.93	27.09	21.96	19.30	21.41	21.31	17.95	26.83	19.76

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Month	Pinto Creek Station		Las Moras Creek		Normandy		Lateral No. 12 Headgate		Coal Mine	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0	0.49	0.30	0.75	0.33	0.81	0.30	0.58	0.40	0.62
Feb.	1.85	.77	2.80	1.00	2.73	.83	2.60	.66	2.45	.79
Mar.	1.85	.52	1.45	.66	1.54	.71	1.28	.56	.95	.68
Apr.	2.30	1.57	2.80	1.46	2.51	1.91	2.60	1.78	3.15	1.76
May	10.40	2.34	4.10	2.17	3.74	2.90	4.10	2.58	5.90	2.70
June	3.45	2.42	7.40	2.72	10.77	2.57	11.00	2.48	8.90	2.50
July	2.40	1.33	1.40	1.32	1.72	1.81	1.28	1.41	1.20	1.84
Aug.	4.60	1.56	4.08	1.88	2.03	1.90	1.45	1.60	2.10	1.62
Sep.	1.01	2.64	.80	3.17	1.27	2.95	1.20	2.70	1.65	3.06
Oct.	.40	2.13	0	2.46	0	2.51	0	2.57	0	2.59
Nov.	0	1.14	.10	1.08	.28	1.10	.10	.94	.50	.82
Dec.	.30	.61	1.22	.80	1.19	.78	1.00	.68	1.00	.63
Yearly	28.56	17.52	26.45	19.47	28.11	20.78	26.91	18.54	28.20	19.61

Month	Eagle Pass		Trees Farm		Farias Ranch		Indio Ranch		El Indio	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.52	0.76	0.45	0.59	0.40	0.68	0.40	0.67	1.75	0.78
Feb.	2.35	.89	1.79	.76	2.55	.98	2.05	.80	3.20	.97
Mar.	1.06	.75	.50	.45	1.10	.55	.40	.58	.10	.55
Apr.	3.75	1.82	2.11	1.85	2.00	1.97	2.00	2.02	2.04	1.84
May	6.72	3.89	9.13	3.12	5.80	3.25	5.10	3.15	4.95	3.42
June	9.53	3.28	12.30	2.34	5.45	2.34	7.11	2.53	8.99	2.35
July	1.82	1.77	1.45	1.51	0	1.78	2.70	1.75	2.93	1.25
Aug.	1.85	2.46	0	1.65	.90	1.87	1.10	1.61	1.25	1.90
Sep.	2.62	3.00	2.55	2.53	.40	3.23	.35	3.02	.48	2.86
Oct.	.04	2.50	0	2.76	0	2.77	0	2.55	0	2.35
Nov.	.64	1.01	0	.83	.50	.84	0	.88	.22	.80
Dec.	.89	.88	.95	.74	1.07	.83	1.00	.81	.81	.73
Yearly	31.79	23.01	31.23	19.13	20.17	21.09	22.21	20.38	26.72	19.80

Month	Van Dalsen Farm		Keisling Farm		Apache Ranch		Laredo Water Plant		Corralitos Ranch	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	1.40	0.63	1.53	0.69	0.50	0.57	0.80	0.75	1.50	0.74
Feb.	2.15	.85	2.33	.87	1.30	.77	2.36	.84	1.75	.72
Mar.	1.20	1.49	1.26	.65	.50	.38	.57	.56	.50	.53
Apr.	2.00	2.13	2.48	2.01	2.50	1.62	1.17	1.23	1.00	1.12
May	3.40	3.27	3.80	3.02	2.10	2.48	5.23	2.46	1.60	2.12
June	5.90	2.16	8.66	2.79	5.00	1.99	4.73	2.24	3.40	2.20
July	2.50	1.43	2.30	1.32	8.30	2.11	2.47	1.11	2.90	1.24
Aug.	1.95	1.70	2.16	1.73	2.90	1.74	3.04	1.86	7.80	1.91
Sep.	0	2.86	0	2.56	0	3.15	1.11	2.81	.50	2.90
Oct.	0	2.46	0	2.44	.40	2.37	.52	1.80	2.00	1.95
Nov.	0	.82	1.04	.79	1.20	.69	.08	.88	.50	.81
Dec.	.80	.79	.80	.93	.10	.74	.08	.87	.80	.63
Yearly	21.30	19.59	26.36	19.80	24.80	18.61	22.26	17.41	24.25	16.87

Month	Huisache Ranch		Zapata Water Plant		Falcon Dam		Roma (Int'l. Bridge)		Garciasville	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	1.00	0.82	1.10	0.89	0.52	0.90	0	0.86	0.07	0.97
Feb.	1.50	.88	1.40	.85	1.70	.99	2.30	1.03	3.25	1.07
Mar.	.50	.60	.40	.57	.49	.60	0	.56	.52	.48
Apr.	1.00	1.29	1.10	1.53	3.11	1.34	2.12	1.37	1.39	1.15
May	1.50	2.19	1.30	2.65	4.79	2.59	3.28	1.96	4.31	2.61
June	3.50	2.55	3.50	2.42	2.29	2.61	2.70	2.32	5.49	2.67
July	2.40	1.38	2.10	1.58	2.26	1.28	1.26	1.27	2.71	1.30
Aug.	2.50	1.50	2.80	1.85	1.92	2.43	4.24	1.90	3.06	1.86
Sep.	.50	3.67	.50	4.08	1.39	4.15	0	4.19	1.12	3.31
Oct.	2.00	2.12	2.10	1.87	.32	2.05	0	1.99	.22	1.78
Nov.	.50	.79	.60	.90	.89	1.10	3.50	.82	.38	.93
Dec.	1.10	.80	1.40	.91	.64	.78	0	.52	.67	.74
Yearly	18.00	18.59	18.30	20.10	20.32	20.82	19.40	18.79	23.19	18.87

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Month	Los Ebanos		La Joya		HCWCID #6 Goodwin Pump No. 4B		HCWCID #6 Goodwin Pump No. 3		Penitas (Edinburg Pumping Plant)	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	1.10	1.07	3.35	1.12	2.60	1.34	2.55	1.39	1.55	1.35
Feb.	.41	.97	.10	1.07	1.40	1.05	1.35	1.32	1.28	1.10
Mar.	0	.42	0	.47	.60	.55	.40	.66	.60	.50
Apr.	0	1.33	0	.93	.55	1.12	.75	1.39	.62	1.29
May	2.26	2.42	3.05	2.43	3.95	2.29	2.95	2.52	3.80	2.54
June	8.81	2.63	5.39	2.83	4.10	2.57	3.90	2.64	4.57	3.02
July	.95	1.18	.30	1.13	4.05	1.36	3.30	1.71	2.23	1.52
Aug.	1.64	1.85	2.93	1.48	2.00	1.62	1.00	1.87	.88	2.26
Sep.	1.64	3.08	2.93	3.04	6.00	3.38	3.55	3.21	4.66	3.59
Oct.	.25	1.85	1.25	1.76	1.00	2.64	.65	2.91	2.37	2.67
Nov.	.81	.82	1.00	.84	.50	.91	.80	.94	1.31	.92
Dec.	.24	.78	.95	.88	.50	1.00	.90	1.08	1.44	1.04
Yearly	18.11	18.40	21.25	17.98	27.25	19.83	22.10	21.64	25.31	21.80

Month	New Mission Pumping Plant		Edinburg Filtration Plant		La Feria Pumping Plant		La Feria Materials Yard		CCWCID #19 (Adams Gardens)	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	1.90	1.25	1.60	1.55	5.50	1.81	4.75	1.78	2.83	1.32
Feb.	1.35	1.16	1.89	1.27	4.80	1.87	4.21	2.17	2.29	1.63
Mar.	.40	.99	.39	.73	1.40	.84	1.90	.84	.73	.75
Apr.	1.05	1.28	.75	1.59	.90	2.02	.81	1.57	.62	1.47
May	4.70	3.12	2.24	2.35	4.00	3.09	3.00	2.78	3.62	2.72
June	4.15	2.75	5.43	2.70	4.90	3.31	6.90	3.75	8.73	2.86
July	2.60	1.59	1.70	1.44	1.70	2.48	2.00	2.64	2.86	1.93
Aug.	1.25	2.18	1.36	2.42	0	3.44	.35	3.05	.86	2.90
Sep.	4.05	3.12	.93	3.69	5.80	6.31	3.10	5.05	2.39	4.16
Oct.	.90	2.46	.34	2.49	0	4.01	0	3.30	.46	2.78
Nov.	1.05	.80	2.13	1.09	3.20	1.98	1.60	1.48	1.94	1.50
Dec.	1.00	.97	.57	1.10	.25	1.61	.03	1.65	.28	1.19
Yearly	24.40	21.67	19.33	22.42	32.45	32.77	28.65	30.06	27.61	25.21

Month	San Benito Pump		CCWCID #11 (Bayview Dist. Off.					
	1987	Average	1987	Average				
Jan.	2.64	1.45	3.54	1.67				
Feb.	1.04	1.08	4.50	1.60				
Mar.	1.03	.79	.80	.66				
Apr.	.80	1.40	1.20	1.80				
May	4.34	2.72	1.69	2.67				
June	3.50	2.55	4.60	2.32				
July	.72	1.74	1.50	1.95				
Aug.	1.05	2.39	0	2.64				
Sep.	0	4.36	6.77	5.81				
Oct.	.56	2.65	2.70	2.40				
Nov.	3.71	1.28	2.72	1.54				
Dec.	.09	1.38	0	1.56				
Yearly	19.48	23.79	30.02	26.62				


## RAINFALL ON THE RIO GRANDE WATERSHED

IN MEXICO

IN INCHES

Tabulated below, in approximate downstream order, are monthly records of Mexican rainfall stations with averages for their periods of record. For location, elevation, period of record, type of gage in use, watershed subdivision in which the station is located, and the observer, see alphabetical listing of these stations following rainfall data. These rainfall records have not been published elsewhere. Records of daily rainfall amounts, where available, are on file in the offices of the Mexican Section of the Commission.

Detailed listings of the months and years for which records are available through 1970 may be found under "Index to Precipitation Records" in Water Bulletins 10, 14, 22, 26, and Supplement 40A.

Month	Cd. Juarez, Chihuahua		Campo Agricola Exper., Chihuahua		Esc. Superior de Agricul., Chihuahua		Banderas, Chihuahua		El Cuarenta, Chihuahua	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.28	0.43	0.55	0.38	0.47	0.65	1.46	0.18		0.48
Feb.	.24	.44	0	.24	.35	.41	2.40	.28	.16	.33
Mar.	.43	.35	.35	.24	.39	.30		.16	.16	.22
Apr.	.31	.29		.20	.12	.57		.07	1.06	.22
May	.28	.36		.34	.08	.37		.18	.83	.36
June	1.34	.67	1.38	.75	2.48	1.65		.62	1.65	.97
July	.55	1.54	.16	1.62	T	1.08		.88	1.50	2.10
Aug.	4.06	1.60	1.89	1.33	3.15	1.97		1.44	6.06	3.05
Sep.	.71	1.42	1.77	1.58	.35	1.40		1.58		1.95
Oct.	.16	1.06	T	.87	T	1.46		.81		1.12
Nov.	.39	.49	.43	.43	.47	.51		.23	.43	.50
Dec.	2.68	.61		.46	.47	.80		.21		.51
Yearly	11.43	9.26		8.44	8.33	11.17		6.64		11.81

Month	Carichic, Chihuahua		San Juanito, Chihuahua		El Vergel, Chihuahua		Balleza, Chihuahua		El Sitio, Chihuahua	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.		0.58		2.00	T	1.36		0.46	0.24	0.34
Feb.	.20	.43	.83	1.07	.39	.72	T	.33	.12	.30
Mar.	.08	.26	.16	.63	.08	.57	0	.15	0	.18
Apr.	1.34	.26	.98	1.04		.53		.24	2.36	.26
May	2.18	.46	.87	.73	2.76	.89	1.06	.27	1.73	.49
June	2.20	1.82	2.01	2.36	6.26	3.54	1.57	1.70	2.32	1.70
July	6.46	5.85	3.98	8.77	9.02	6.94	4.84	4.70	6.97	4.32
Aug.	6.65	5.16	6.69	6.85	7.64	7.04	4.09	4.87	3.94	4.93
Sep.	2.13	3.83	4.17	4.41	5.16	4.76	1.77	3.37	1.57	3.45
Oct.	.28	1.12	.35	2.33	T	1.92	.28	.92	.55	.92
Nov.	.04	.57	.28	1.31	.24	.65	T	.45	2	.37
Dec.	1.02	.81	1.57	2.07		1.29	.08	.47		.38
Yearly		21.15		33.57		30.21		17.93		17.64

Month	La Boquilla, Chihuahua		Estacion Rosario, Durango		Villa Coronado, Chihuahua		Hidalgo del Parral, Chihuahua		Valle Allende, Chihuahua	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.		0.31	0	0.41	0.47	0.72	0.47	0.19	0.20	0.40
Feb.	T	.18	0	.23	.31	.31	T	.21	T	.17
Mar.	T	.15	0	.13	0	.17	T	.09	0	.08
Apr.	1.73	.24	.59	.34	4.72	.60		.19	1.69	.30
May	1.42	.56	1.46	.70	1.38	.81	1.81	.48	2.01	.85
June	.35	1.42	1.38	2.25	2.36	3.23	5.51	1.73	1.73	2.04
July	3.74	2.90	7.13	4.33	5.39	4.30		.22	7.20	3.89
Aug.	4.05	2.96	5.55	4.84	8.27	5.45	5.24	4.47	4.69	4.72
Sep.	1.38	2.99	3.35	4.61	9.02	4.47	3.39	4.57	4.06	3.65
Oct.	.04	.87	.12	1.14	2.56	1.50	.35	1.14	.12	.84
Nov.	T	.32	0	.32	0	.50		.48	0	.30
Dec.	0	.35	0	.40	.08	.51	T	.36	.16	.36
Yearly		13.25	19.58	19.70	34.56	22.57		18.13	21.86	17.60

T Trace

## RAINFALL ON THE RIO GRANDE WATERSHED

IN MEXICO

IN INCHES

Month	Escalon, Chihuahua		Jimenez, Chihuahua		Camargo, Chihuahua		Noncava, Chihuahua		El Maguey, Chihuahua	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.20	0.43	0.08	0.35	0.20	0.48	0.49	0.04	0.42	
Feb.	.20	.18	.20	.16	T	.25	.34	.04	.31	
Mar.	0	.09	0	.11	T	.12	.28	T	.18	
Apr.	3.39	.53	1.26	.20	2.28	.27	1.14	.27	1.38	.27
May	1.26	.74	2.36	.58	2.20	.64	.98	.39	1.34	.49
June	1.22	1.87	1.30	1.50	1.50	1.67	1.46	2.22	2.76	1.73
July	2.44	2.40	4.88	3.23	4.96	3.23	5.28	4.84	8.58	3.76
Aug.	3.27	2.86	5.24	2.65	7.17	3.09	3.03	3.93	3.15	4.20
Sep.	8.03	2.82	2.52	2.33	1.61	2.98	1.06	2.92	2.99	3.45
Oct.	.67	1.24	.20	1.15	.08	.99	.31	1.09	.12	.93
Nov.	.16	.30	T	.24	.04	.36	0	.46	T	.27
Dec.	.35	.40	.04	.25	.08	.36	.39	.51		.31
Yearly	21.19	13.86	18.08	12.75	20.12	14.44		17.74		16.32

Month	Las Virgenes, Chihuahua		Km. 135, Chihuahua		Delicias, Chihuahua		Lazaro Cardenas, Chihuahua		Meoqui, Chihuahua	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0	0.30	0	0.26	0.16	0.37	0	0.28	0.08	0.33
Feb.	.04	.13	.22	.08	.16	.08	.24	.12	.19	
Mar.	0	.10	0	.11	T	.13	0	.11	T	.13
Apr.	2.56	.29	.34	3.43	.35	4.06	.39	3.46	.52	
May	1.46	.35	.51	2.13	.39	1.61	.56	1.81	.58	
June	.83	1.24	1.13	1.38	1.21	1.14	1.35	1.02	1.37	
July	7.32	2.74	2.31	3.03	2.47	4.76	2.79	2.72	2.53	
Aug.	2.83	2.65	2.69	3.58	2.52	2.17	2.53	1.57	2.73	
Sep.	1.89	2.48	3.19	2.36	2.35	2.64	2.88	2.99	2.54	
Oct.	.28	.86	.06	.67	.84	.55	.83	.28	.97	
Nov.	T	.24	.34	T	.27	T	.33	T	.26	
Dec.	0	.37	.38	T	.38	T	.24	.04	.39	
Yearly	17.21	11.75		12.44	16.82	11.44	17.01	12.53	14.09	12.54

Month	Las Burras, Chihuahua		Cd. Guerrero, Chihuahua		Bachiniva, Chihuahua		Cuauhtemoc, Chihuahua		Colonia Anahuac, Chihuahua	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0	0.32	T	0.63	0.52	0	0.36	.16	.04	.41
Feb.	0	.19	.08	.40	T	.18	.12	.16	.26	
Mar.	0	.12	T	.25	0	.30	T	.16	.19	
Apr.	4.13	.33	1.69	.22	1.89	.21	2.64	.25	2.48	.36
May	1.65	.49	1.42	.34	1.61	.30	3.54	.43	.50	
June	.63	1.26	1.06	1.52	.39	1.54	1.58	1.22	1.66	
July	3.62	2.76	6.73	4.90	3.78	5.13	4.41	4.59	3.74	4.51
Aug.	.24	2.57	6.14	5.11	7.05	4.77	7.20	4.38	3.58	4.96
Sep.	3.70	2.42	2.83	3.16	1.06	2.75	2.76	2.92	1.46	3.51
Oct.	.59	.81	.08	1.17	.08	1.09	.20	1.15	.16	1.10
Nov.	.24	.08	.50	0	.34	.04	.30	.08	.33	
Dec.	0	.37	.71	.74	.94	.50	.12	.44	.04	.32
Yearly		11.88	20.82	18.94		17.63		16.72		18.11

Month	Presa Chihuahua, Chihuahua		Chihuahua, Chihuahua		Majalca, Chihuahua		Posta Zootenica, Chihuahua		Villa Aldama, Chihuahua	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	T	0.30	T	0.31	0.47	0.55	0.04	0.38	0	0.29
Feb.	T	.18	.12	.20	.31	.36	T	.21	.12	.17
Mar.	0	.16	T	.20	0	.36	T	.17	0	.24
Apr.	3.15	.38	2.99	.26	2.95	.48	3.35	.46	3.23	.40
May	3.27	.93	2.44	.54	1.50	.87	3.11	.81	2.48	.52
June	1.93	2.20	2.09	1.54	2.40	2.56	1.54	1.56	.51	1.61
July	2.24	3.98	4.41	3.58	5.39	6.01	2.05	3.29	2.64	2.69
Aug.	7.05	4.53	7.13	3.49	5.87	6.24	4.17	3.98	3.82	2.85
Sep.	5.12	3.57	5.13	2.95	1.65	4.81	4.65	3.25	2.95	3.24
Oct.	T	1.05	.16	.93	.91	1.15	.04	1.17	.47	.87
Nov.	.08	.35	.08	.42	.12	.44	.08	.34	0	.31
Dec.	.16	.41	.35	.42	.12	.47	.12	.35	.12	.39
Yearly	23.00	18.04	25.20	14.84	21.69	24.30	19.15	15.97	16.34	13.58

T Trace

## RAINFALL ON THE RIO GRANDE WATERSHED

IN MEXICO

IN INCHES

Month	Presa Luis L. Leon, Chihuahua		Maclovio Herrera, Chihuahua		Majoma, Chihuahua		Coyame, Chihuahua		Gallego, Chihuahua	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0	0.27	0.08	0.35	T	0.46	0	0.30	0.28	0.38
Feb.	0	.15	.12	.20	.35	.34	.08	.28	.43	.37
Mar.	T	.12	0	.12		.19	.08	.15	T	.19
Apr.	1.26	.29	2.72	.38		.35	2.24	.40	1.42	.28
May	2.95	.63	1.97	.59		.86	1.77	.65	.63	.38
June	1.34	1.51		1.37	1.22	1.75	2.20	1.81	.75	1.19
July	4.72	2.24	5.47	2.64	2.64	2.79	1.61	2.32	.71	3.02
Aug.	2.40	2.91	4.25	2.79	3.31	3.27		2.49	5.08	3.46
Sep.	1.18	2.40	2.17	3.13	2.48	2.78	.20	2.77		.86
Oct.	1.26	.91	.67	.88	.59	1.09	.43	1.06	.44	1.32
Nov.	T	.34		.38	T	.46	.08	.44	.28	.37
Dec.	.12	.38	.12	.60	.43	.45	0	.33	.83	.40
Yearly	15.23	12.15		13.43		14.79		13.00		14.22

Month	Ojinaga (IB&WC), Chihuahua		Ojinaga (M.S. of Mexico), Chihuahua		Manuel Benavides, Chihuahua		Sierra Mojada, Coahuila		La Chuparrosa, Coahuila	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0	0.36	0	0.31	T	0.21	0	0.65	0	0.30
Feb.	.67	.25	.35	.23	.20	.23	0	.30	1.66	.56
Mar.	.04	.16	T	.19	.04	.20	0	.25	.40	.40
Apr.	1.57	.38	1.65	.32	1.10	.37	.83	.36	1.81	1.22
May	1.22	.54	1.22	.61	1.34	1.18	1.26	1.06	5.00	1.48
June	3.39	1.52	3.11	1.28	1.73	1.69	1.22	2.30	1.92	1.62
July	1.42	1.61	1.10	1.57	2.83	2.07	1.38	2.86	1.70	1.48
Aug.	.94	1.69	1.06	1.62		2.64	9.72	3.05	1.43	2.10
Sep.	1.54	1.77	1.34	1.66	1.89	2.73	3.58	3.04	.67	2.23
Oct.	.43	1.08	.39	1.05	.43	1.06	0	1.37	0	1.70
Nov.	0	.44	T	.38		.36	0	.53	2.00	.69
Dec.	.37		.16	.43	.43	.38	.51	.69	.25	.32
Yearly		10.17	10.38	9.65		13.12	18.50	16.46	16.84	14.10

Month	Presa Centenario, Coahuila		Amistad Res. near Tlaloc, Coahuila		La Amistad, . Coahuila		Represa Amistad, Coahuila		Cd. Acuna, Coahuila	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.		0.55	0.12	0.43	0.16	0.67	0.04	0.37	0.31	0.58
Feb.	1.46	.74	1.25	.73	2.36	.91	.94	.64	2.20	.90
Mar.	1.06	.63	.90	.69	2.13	.70	.83	.50	.71	.70
Apr.	2.40	1.50	2.10	1.09	1.34	1.71	1.02	1.05	3.94	1.84
May	7.52	2.29	1.60	1.77	5.04	2.30	3.15	1.65	4.72	2.35
June	6.42	2.54	.10	2.30	3.86	2.84	1.89	1.76	7.17	2.35
July	1.10	1.32	3.60	2.39	2.09	1.24	.83	1.84	2.05	1.61
Aug.	4.13	2.27	1.75	2.00	2.05	.67	1.26	1.52	3.03	1.70
Sep.	.20	3.13	.40	2.33	2.80	1.86	1.26	2.15	1.06	2.84
Oct.	.24	2.56	2.20	2.08	.16	2.39	0	2.21	.24	2.59
Nov.	.75	1.07	.40	.82	.39	1.31	T	.73	.59	.79
Dec.	.75	.72	.35	.65	.47	.74	.08	.37	.59	.65
Yearly		19.32	14.77	17.28	22.85	17.34	11.30	14.79	26.61	18.90

Month	Palestina, Coahuila		Emiliano Zapata, Coahuila		Jimenez, Coahuila		Piedras Negras, Coahuila		Zaragoza, Coahuila	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.47	0.82	0.31	1.23	0.67	0.70	T	0.69	0.28	1.48
Feb.	2.28	.95	2.72	.89	1.38	.86	.75	.88	1.97	.82
Mar.	1.50	.73	2.95	.93	1.73	.73	.20	.60	.94	.74
Apr.	2.80	1.81	1.38	1.93	1.85	1.72	.51	1.88	2.48	2.28
May	7.72	2.52	7.05	3.65	7.01	2.53	6.81	3.59	2.99	3.96
June	6.10	2.39	9.02	3.27	4.29	2.55	7.64	2.73	8.03	3.42
July	1.54	1.84	1.42	2.08	3.15	1.62	2.44	1.96	1.89	.95
Aug.	2.60	2.23	2.36	1.75	4.17	1.68	2.72	2.33	3.16	1.83
Sep.	.87	3.10	4.53	2.28	1.14	2.89	2.13	3.08	2.52	2.09
Oct.	.20	2.26	.20	1.75	T	2.53	.08	2.77	0	1.97
Nov.	.83	.90	.59	1.86	.31	1.11	.51	.91	.12	1.32
Dec.	0	.76	0	1.17	1.50	.72	1.77	.73	1.02	.96
Yearly	26.91	20.31	32.53	22.79	27.20	19.64	25.56	22.15	25.70	21.82

T Trace

## RAINFALL ON THE RIO GRANDE WATERSHED

IN MEXICO

IN INCHES

Month	Guerrero, Coahuila		Villa Hidalgo, Coahuila		Colombia (SARB), Nuevo Leon		Jarita, Nuevo Leon		Muzquiz, Coahuila		
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average	
Jan.	0.71	0.56	0.55	0.75	0.47	0.84	0.55	0.64	0.91	0.85	
Feb.	1.81	.71	.94	.84	2.32	.67	2.87	.94	2.68	.63	
Mar.	.63	.52	.79	.68	1.26	.58	.24	.53	.75	.74	
Apr.		1.96	1.57	1.80	2.09	1.99	1.54	1.73	1.34	1.17	
May		3.00	2.28	2.83	3.66	2.84	3.46	3.32	6.81	3.72	
June		2.72	2.83	2.28	3.23	1.92	0	1.94	6.89	3.40	
July		1.44	4.76	1.20	3.86	1.00	5.00	1.17	4.92	2.74	
Aug.		1.98	1.34	2.12	1.57	.45	3.50	2.03	10.43	2.96	
Sep.		3.29	.31	3.28	.08	1.39	T	2.66	2.05	4.92	
Oct.		2.63	.31	2.14	.51	2.80	.63	2.05	.08	2.17	
Nov.		.74	.24	.92		.84	.67	1.15	2.91	1.17	
Dec.		.61	.16	.80	.71	.87	.20	.87	.24	.84	
Yearly			20.16	16.08	19.64		16.19	18.66	19.03	40.01	25.31

Month	Sabinas, Coahuila		Cuatro Cienegas, Coahuila		Ocampo, Coahuila		Progreso, Coahuila		Castanos, Coahuila	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.28	0.61	0.08	0.36	0	0.50	0.67	0.52	0.39	0.64
Feb.	2.01	.69	.83	.34	1.02	.28	1.97	.67	.71	.51
Mar.	.67	.38	.24	.13	.04	.18	.47	.35	0	.21
Apr.	1.18	1.32	.39	.39	.51	.78	.94	1.26	.59	.98
May	8.46	2.70	.79	.82	3.43	1.25	4.84	2.18	2.05	2.00
June	3.58	2.20	2.09	.78	3.15	1.64	.59	1.82	1.10	2.03
July	4.33	1.40	.35	.92	1.06	1.62	2.36	1.09	4.72	1.78
Aug.	3.78	2.04	1.73	1.14	1.89	1.50	2.95	1.86	1.61	2.32
Sep.	.75	3.40	3.50	1.41	3.03	1.97	3.03	2.96	5.35	2.69
Oct.	.55	1.89	.51	.82	1.46	1.07	.51	1.79	0	1.65
Nov.	.20	.63	0	.43	0	.46	.20	.60	0	.32
Dec.	.16	.51	0	.47	0	.44	0	.51	0	.27
Yearly	25.95	17.77	10.51	8.01	15.59	11.69	18.53	15.61	16.52	15.40

Month	Presa Carranza, Coahuila		Lag. de Salinillas, Nuevo Leon		Candela, Coahuila		Lampazos, Nuevo Leon		San Nicolas, Nuevo Leon		
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average	
Jan.	0.59	0.71	0.83	0.69			0.80	0.51	0.79	0.51	
Feb.	1.97	.67	3.50	.75			.48	.75	2.68	.94	
Mar.	.87	.48	.43	.53			.12	.49	.79	.80	
Apr.	1.02	1.31	2.40	1.37			1.31	2.32	1.30	2.19	
May	5.31	2.15	4.33	2.41			1.63	.59	2.31	3.67	
June	.67	1.83	1.38	2.00			1.97	6.38	2.92	4.09	
July	1.50	1.01	2.28	1.00			2.20	3.35	1.79	4.69	
Aug.	3.39	1.90	4.45	2.20			1.80	4.72	1.80	3.03	
Sep.	.71	2.93	2.56	3.07	3.11	2.75	.43	4.86	.59	1.93	
Oct.	.59	1.75	.87	2.09	0	1.35	.79	2.02	.51	2.42	
Nov.	.35	.59	.28	.69	.04	.58	T	.76	.59	.54	
Dec.	T	.63	.08	.64	.24	.50	0	.58	.16	.85	
Yearly	16.97	15.96	23.39	17.44			15.49		20.37	26.34	20.61

Month	Anahuac, Nuevo Leon		Espinazo, Nuevo Leon		Villaldama, Nuevo Leon		Fresnillo, Nuevo Leon		Ojo de Agua (Sabinas), N. L.	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.63	0.75	0.51	1.53	0.43	1.50	0.67	1.42	0.47	1.70
Feb.	3.58	.69	1.46	.55	1.02	.56	.28	.58	3.11	.96
Mar.	.67	.52	T	.15	.71	.25	2.48	.90	.94	.40
Apr.	2.56	1.30	.59	1.74	4.92	1.99	.47	.66	2.01	2.03
May	4.76	2.52	3.74	3.13	3.39	2.23	.28	1.12	1.02	4.25
June	2.95	2.11	1.10	1.23	1.54	3.17	0	.66	3.39	2.18
July	5.63	1.40	2.36	1.65	2.60	1.57	1.06	.45	2.09	1.58
Aug.	6.38	2.32	4.06	1.50	6.81	2.71	.10	1.85	1.90	
Sep.	2.09	3.07	5.51	1.64	3.23	3.76	1.81	.47	1.94	
Oct.	.51	1.75	.47	1.69	.94	1.38	.41	.43	1.60	
Nov.	.79	.68	.55	.48	.20	.72	.34	.04	.35	
Dec.	.20	.75	.08	.56	.04	.63	.66	T	.34	
Yearly	30.75	17.86	20.43	15.85	25.83	20.47		9.11	15.82	19.23

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## RAINFALL ON THE RIO GRANDE WATERSHED

IN MEXICO

IN INCHES

Month	Garza Ayala, Nuevo Leon		Vallecillo, Nuevo Leon		Nueva Cd. Guerrero, Tamaulipas		La Escondida, Nuevo Leon		Agualeguas, Nuevo Leon	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.43	0.88	0.43	0.81	0.71	1.00	2.44	1.84	0.83	1.94
Feb.	1.89	.68	1.69	.79	1.81	1.02	2.48	1.15	1.10	.88
Mar.	.67	.46	.51	.49	.63	.52	1.50	.83	0	.60
Apr.	.98	1.86	1.73	2.01	2.52	1.47	.47	3.39	0	2.11
May	2.48	2.13	2.48	2.07	5.39	2.70	1.30	2.39	.98	3.22
June	2.60	2.35	3.58	3.15	1.46	2.62	6.02	3.66	2.52	2.33
July	4.21	3.74	2.80	1.60	2.09	1.29	2.20	.88	1.14	1.44
Aug.	5.24	2.14	6.38	1.88	4.45	2.07	2.20	3.51	7.48	2.46
Sep.	.87	3.99	.55	4.09	1.81	3.93	9.29	3.85	0	1.85
Oct.	1.02	2.49	.51	1.95	.31	2.03	1.22	2.08	.75	2.39
Nov.	.39	1.62	.20	.82	1.14	1.01	.79		.98	.98
Dec.	.20	.50	.24	.71	.71	.79		2.03	.54	
Yearly		20.98	22.84	21.10	20.37	23.03	20.45		26.40	
										20.83

Month	General Trevino, Nuevo Leon		Paras, Nuevo Leon		Cd. Mier, Tamaulipas		Miguel Aleman, Tamaulipas		San Juan de Vaqueria, Coahuila	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.		1.56	2.36	0.88	1.06	1.07	2.91	1.12	1.61	1.33
Feb.	0	1.22	2.28	.78	1.93	1.19	3.07	1.18	1.42	.58
Mar.	.91	.72	.79	.57	.67	.60	.83	.40	0	.23
Apr.	.63	2.34	.91	.97	1.81	1.53	2.01	1.78	1.10	1.22
May	1.46	3.82	2.91	2.19	.75	2.74	5.20	2.46	1.02	1.85
June	2.83	2.67	3.19	2.91	6.06	2.68	2.95	3.18	3.46	2.22
July	.94	.92	2.01	1.42	1.61	1.20		1.81	5.16	3.21
Aug.	3.31	2.09	6.30	2.28	2.44	2.52		1.85	3.43	3.40
Sep.	.08	4.22	.55	3.32	.94	4.36		4.97	2.80	2.52
Oct.	1.90	.28	2.17	.67	2.09		2.09	0	2.05	
Nov.	.82	.28	.87	1.14	1.05		.94	.20	.39	
Dec.	1.28	.51	.64	.85			.87	.39	.36	
Yearly		23.56	22.37	19.00		21.88		22.65	20.59	19.36

Month	General Cepeda, Coahuila		Hipolito, Coahuila		Reata, Coahuila		San Antonio de las Alazanas, Coahuila		Saltillo, Coahuila	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	1.34	0.53	1.18	0.71	0.39	0.45	2.95	1.17	1.46	0.61
Feb.	1.10	.48	0	.44	1.46	.26	2.28	.74	1.57	.55
Mar.	0	.25	0	.47	0	.26	0	.43	.04	.38
Apr.	1.14	.49	0	.75	1.06	.58	3.46	1.05	1.18	.80
May	1.54	.89	0	.72	.59	.92	3.62	1.99	2.87	1.24
June	.71	2.08	0	.36	3.62	1.24	1.18	2.63	.87	2.11
July	2.80	3.09	0	.59	1.46	1.05	2.68	3.31	3.35	2.52
Aug.	1.14	2.86	0	.78	2.13	1.44	2.56	3.01	3.31	2.46
Sep.	3.46	2.79	1.18	1.01	2.64	1.52	1.06	2.59	3.82	2.67
Oct.	.04	1.19	.39	.74	.24	.80	.20	1.74	.12	1.27
Nov.	.35	.49	0	.39	.16	.49	.75	.97	.35	.78
Dec.	.55	.56	0	.25	0	.39	1.65	.94	.47	.64
Yearly	14.17	15.70	2.75	7.21	13.75	9.40	22.39	20.57	19.41	16.03

Month	Ramos Arizpe, Coahuila		Huachichil, Coahuila		Carbonera, Nuevo Leon		Icamole, Nuevo Leon		Mina, Nuevo Leon	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	1.14	0.51	3.90	3.16	2.56	1.02	0.43	0.45	0.51	0.65
Feb.	1.54	.37	2.05	1.55		.60	.87	.31	1.06	.41
Mar.	.04	.27	0	.53		.50	0	.15	.28	.16
Apr.	1.06	.51	.55	1.71		1.10	1.97	.41	1.65	.65
May	1.81	.93	2.64	3.17		1.99	1.06	.80	.63	.84
June	.24	1.04	2.87	2.63		2.65	.35	.90	.51	1.41
July	1.97	1.35	4.29	4.17		2.83	.35	.58	2.24	1.26
Aug.	1.57	1.32	1.69	2.84		0	.80	.75	1.54	
Sep.	2.80	1.70	2.09	2.61		2.55	1.77	1.95	2.83	2.95
Oct.	3.94	.83	.16	1.75		1.85	.35	.98	.55	.98
Nov.	.28	.46	.51	.67		.99	.16	.64	.12	.64
Dec.	.87	.49	2.28	.81		.98	.43	.47	.31	.48
Yearly	17.26	9.78		24.45		19.90	7.74	8.44	11.44	11.97

## RAINFALL ON THE RIO GRANDE WATERSHED

IN MEXICO

IN INCHES

Month	La Popa, Nuevo Leon		La Arena, Nuevo Leon		Cienega de Flores, Nuevo Leon		Hacienda Mamulique, Nuevo Leon		La Pomona, Nuevo Leon	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0	.52	0.28	0.89	0.47	1.20	0.43	1.00	2.01	1.76
Feb.	0	.62	.91	.75	1.14	.94	.43	.40	.35	.68
Mar.	0	.22	.55	.59	.63	.98	.28	.44	.35	.98
Apr.	0	.57	1.02	1.36	.98	1.49	8.11	1.84	1.85	2.47
May	1.50	1.04	4.88	2.95	4.02	2.61	3.23	1.78	6.10	5.46
June	.79	1.50	6.26	3.22	4.72	3.32	3.74	2.95	3.27	3.26
July	.39	1.18	3.31	2.88	2.24	2.27	2.91	2.85	3.46	2.17
Aug.	.24	1.61	2.64	3.25	2.87	4.27	4.72	3.04	1.46	2.71
Sep.	1.30	2.72	2.99	5.20	3.39	5.54	2.17	4.42	4.09	4.16
Oct.	.39	.67	.47	2.66	.67	2.55	.87	1.75	.35	1.16
Nov.	.08	.59	.28	.82	.55	1.12	1.61	1.14	.24	.66
Dec.	0	.65	.31	.69	.51	1.17	.51	1.03	.20	1.25
Yearly	4.69	11.89	23.90	25.26	22.19	27.46	29.01	22.64	23.73	26.72

Month	San Diego, Nuevo Leon		Una de Gato, Nuevo Leon		Ejido Marin, Nuevo Leon		La Huasteca, Nuevo Leon		Vaugeria, Nuevo Leon	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	5.87	2.88	0.71	1.37	0.67	1.41	0.16	0.73	3.19	2.02
Feb.	.91	.43	.59	.94	.76	.16	.18	.43	1.03	
Mar.	1.77	.56	.04	.43	.39	.55	.39	.13	.51	1.18
Apr.	2.68	5.31	.20	2.48	.51	1.63	0	.50	.94	1.75
May	4.49	6.65		4.25	2.95	3.04	2.01	2.12	8.19	4.52
June	4.92	5.18	4.65	5.19	8.66	2.88	2.01	1.57	4.17	2.88
July	6.18	1.63		1.34	4.09	1.76	1.54	1.22	2.17	1.44
Aug.	5.43	4.26	2.01	3.09	3.86	1.99	.63	1.26	2.83	2.30
Sep.	9.72	5.91	1.77	4.96	2.64	3.97	6.89	3.91	3.62	3.65
Oct.	2.20	1.65	.67	3.68	.55	1.67	.39	1.13	1.10	1.65
Nov.		.57	.59	.73	.20	.62	.35	.27	.12	.76
Dec.		1.31	1.18	1.64	.71	1.55	.16	.53	.24	1.89
Yearly		36.34		29.75	26.17	21.83	14.69	13.55	27.51	25.07

Month	Topo Chico, Nuevo Leon		Tepehuaje, Nuevo Leon		Gomez Farias, Coahuila		Higueras, Nuevo Leon		Los Ramones, Nuevo Leon	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.98	0.55	1.22	1.92	4.53	1.82	0.79	0.76	1.18	0.84
Feb.	.94	.56	1.46	.71	2.09	.84	1.30	.63	.94	.74
Mar.	1.85	.49	1.34	.68	.12	.14	.31	.67	.98	.66
Apr.	2.17	1.18	1.10	2.28	.16	1.17	.71	1.29	.51	1.45
May	1.73	1.67	2.64	4.71	2.13	1.68	2.64	2.17	3.66	2.91
June	2.28	2.27	4.57	3.23	4.06	2.12	4.96	2.67	8.07	3.28
July	2.20	1.57	1.77	1.87	2.87	1.94	1.10	2.20	3.11	1.85
Aug.	2.28	2.93	6.02	3.43	1.50	2.25	2.09	3.33	4.25	3.44
Sep.	5.47	4.71	5.04	5.24	2.56	2.22	4.33	4.85	2.01	5.56
Oct.	1.30	3.06	.63	1.71	.12	1.16	1.10	1.85	.16	2.62
Nov.	.51	.73	.31	.81	.59	.48	.39	.78	.28	.71
Dec.	.08	.48	.20	1.23	1.14	.88	.47	.75	.63	.65
Yearly	21.79	20.20	26.30	27.82	21.87	16.70	20.19	21.95	25.78	24.71

Month	Cerro Prieto, Nuevo Leon		Los Herrera, (La Tableta), N.L.		Madero(Los Aldamas), Nuevo Leon		Rinconada, Nuevo Leon		Santa Catarina, Nuevo Leon	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	2.76	1.04	1.06	0.74	0.67	1.29	0.83	0.42	1.18	0.72
Feb.	.59	.63	1.26	.66	1.42	.86	1.77	.31	.83	.42
Mar.	.67	.52	.71	.61	0	.75	0	.19	.51	.31
Apr.	.94	1.50	.51	1.38	1.18	1.35	1.42	.53	1.30	.78
May	2.72	4.59	6.93	2.92	5.16	3.35	1.18	.67	1.73	1.09
June	6.18	3.79	2.09	2.79	.87	3.78	.12	1.06	1.85	1.93
July	2.80	2.11	4.17	1.84	4.37	2.25	.47	.61	0	1.16
Aug.	2.24	3.19	2.17	2.65	2.56	4.03	1.10	1.20		2.61
Sep.	5.79	4.92	2.20	4.70	1.50	5.10	4.65	1.91	22.99	4.68
Oct.	1.14	2.64	.24	2.19	.20	1.64	.28	.90	.47	1.62
Nov.	.24	.74	.20	.65	.20	.50	.20	.37	.16	.53
Dec.	.43	.85	.71	.60	.94	1.06	.39	.38	0	.54
Yearly	26.50	26.52	22.25	21.73	19.07	25.96	12.41	8.55		16.39

## RAINFALL ON THE RIO GRANDE WATERSHED

IN MEXICO

IN INCHES

Month	Monterrey, Nuevo Leon		Apodaca, Nuevo Leon		Pajonal, Nuevo Leon		La Cruz, Nuevo Leon		Tunel San Fco., Nuevo Leon	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.63	0.64	1.10	0.71	1.50	0.69	2.64	1.22	1.50	1.28
Feb.	1.06	.68	1.06	.78	2.09	.64	2.48	.70	2.40	1.17
Mar.	1.10	.73	1.14	.61	0	.30	.35	.36	2.40	1.37
Apr.	1.69	1.17	1.89	1.38	2.13	1.17	2.52	1.36	3.43	2.36
May	3.19	1.82	1.14	2.30	2.40	2.13	6.46	2.11	3.23	3.98
June	3.11	2.79	2.99	2.84	0	2.61	7.28	2.96	8.50	6.31
July	2.40	2.37	3.54	2.02	0	2.46	4.09	3.09	5.12	4.01
Aug.	0	3.19	1.93	2.91	0	3.58	5.67	3.86	5.00	6.71
Sep.	6.18	6.03	4.17	5.12	9.92	5.28	1.93	6.15	6.97	11.15
Oct.	1.10	3.14	1.65	2.15	.20	1.94	2.21	3.90	5.72	
Nov.	.16	1.18	.43	.88	.43	.53	.47	.79	.35	1.67
Dec.	.04	.71	.12	.81	.31	.56	1.57	.50	.24	1.06
Yearly	20.66	24.45	21.16	22.51	18.98	21.89		25.31	43.04	46.79

Month	Las Comitas, Nuevo Leon		Rodrigo Gomez Res., Nuevo Leon		Las Enramadas, Nuevo Leon		Adjuntas, Nuevo Leon		Villa Allende, Nuevo Leon	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.67	0.39	1.14	0.99	1.42	0.99	1.01	1.97	1.17	
Feb.	.71	.42	2.17	.96	1.65	.70	.59	2.48	1.26	
Mar.	0	.21	.75	1.05	.55	.68	.83	.42	1.42	1.24
Apr.	1.38	.74	2.36	1.81	.55	1.79	3.50	1.77	2.68	2.66
May	2.68	1.19	2.76	2.97	8.74	3.00	4.72	3.10	3.15	3.92
June	1.54	2.32	7.20	5.57	9.45	3.29	5.75	7.05	14.02	5.58
July	1.22	1.71	.79	4.03	2.05	2.26		4.42	5.67	3.53
Aug.	1.54	3.14	2.56	6.04	6.02	3.71		5.35	9.53	5.39
Sep.	6.30	4.73	8.03	9.74	8.74	6.40		11.28		9.15
Oct.	T	1.72	3.90	4.94	.55	2.53	0	4.49		5.15
Nov.	.28	.48	.28	1.31	.12	.75	12.95	1.51		1.61
Dec.	.28	.38	.08	.90	.28	.81		.42		1.08
Yearly	16.60	17.43	32.02	40.31	40.12	26.91		41.41		41.74

Month	Pobladores, Nuevo Leon		Potrero de Abrego, Coahuila		Laguna de Sanchez, Nuevo Leon		Cerritos, Nuevo Leon		Cienega del Toro, Nuevo Leon	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	3.31	2.13	1.69	2.95	2.13	0.76		1.01	1.33	
Feb.	.83	1.15	2.52	.75	1.50	.63		.84	.54	
Mar.	.63	.62	.12	.40	0	.38		.55	0	.69
Apr.	.87	2.04	3.23	1.29	3.86	1.19		1.66	1.63	
May	0	2.52	3.27	1.74	5.71	1.93		4.31	3.54	2.50
June	0	2.58	3.15	1.89	3.23	3.43		6.36	2.20	2.48
July	0	1.55	.79	.26	2.80	2.46		5.23	4.13	2.90
Aug.	0	.78	2.56	1.27	1.57	4.19	5.91	5.32	3.43	3.01
Sep.	3.03	3.46	3.46	2.50	5.39	6.40	9.02	11.56	2.48	3.27
Oct.	.87	1.28	.24	.90	1.06	2.55	5.94	3.94	.24	1.97
Nov.	.12	.52	.16	.37	.43	.67	.31	.68	.51	.82
Dec.	.28	2.62	1.10	.78	.24	.55	.47	1.14	.77	
Yearly	9.94	21.25	22.29	15.10	27.92	25.14		41.93		21.91

Month	Mimbres, Nuevo Leon		Rayones, Nuevo Leon		Galeana, Nuevo Leon		Cabezonnes, Nuevo Leon		Linares, Nuevo Leon	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.		1.63	1.61	0.51	2.17	0.68	1.85	1.14	2.64	0.93
Feb.	.20	1.16	.94	.40	.08	.46	1.34	.85	1.06	.86
Mar.	2.01	1.03	.08	.32	.87	.34	1.61	1.11	1.34	1.03
Apr.		1.70	2.05	1.10	1.65	1.44	1.61	2.56	1.18	2.37
May		2.74	3.86	1.85	5.00	1.94	4.13	4.14	2.32	3.78
June		3.35	1.81	2.14	3.74	2.12	5.31	4.21	5.20	3.98
July	3.27	2.75	2.32	1.21	2.20	1.62	3.54	2.90	6.22	2.67
Aug.	3.50	3.43	1.61	2.72	.83	2.33	4.72	5.13	3.15	3.72
Sep.	2.83	3.90	2.48	3.36	2.28	3.15	10.24	8.25	6.10	6.30
Oct.	.24	2.11	.28	1.55	0	1.34	3.86	3.36	1.81	3.45
Nov.	.87	1.21	.39	.43	.39	.29	.43	1.08	.31	1.14
Dec.	1.69	1.14	.43	.39	.39	.67	.43	.87	.20	1.07
Yearly		26.15	17.86	15.98	19.60	16.38	39.07	35.60	31.53	31.30

## RAINFALL ON THE RIO GRANDE WATERSHED

IN MEXICO

IN INCHES

Month	Montemorelos, Nuevo Leon		El Realito, Nuevo Leon		Cienega de La Purisima, Coahuila		El Cuchillo, Nuevo Leon		General Bravo, Nuevo Leon	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	1.65	0.93	3.50	1.23	3.31	3.40	1.22	0.75	1.14	0.84
Feb.	1.93	.95	.39	.52	4.41	1.63	1.22	.58	1.30	.61
Mar.	1.26	1.12	.59	.51	0	.31	.47	.51	.59	.55
Apr.	1.22	2.34	1.18	1.71	.98	1.53	1.18	1.38	.98	1.49
May	1.61	3.48	4.53	3.16	7.80	4.33	3.19	2.47	4.02	2.98
June	6.38	4.06	5.04	3.30	3.23	3.33	4.09	2.67	4.41	2.67
July	4.45	2.36			2.43	6.65	3.66	3.90	1.85	3.03
Aug.	5.24	4.14			3.56	5.83	4.10	.58	2.79	1.81
Sep.	14.02	6.72			5.59	3.07	4.43	3.90	4.43	2.76
Oct.	2.72	3.75			1.72	0	2.57	1.30	2.30	1.94
Nov.	.51	1.61			.43	.31	1.44	.43	.57	.43
Dec.	.35	.94			.87	5.12	1.87	.51	.59	.67
Yearly	41.34	32.40			25.03	40.71	32.60	22.39	20.89	21.38
										21.86

Month	Cerralvo, Nuevo Leon		El Cuervito, Nuevo Leon		Comales, Tamaulipas		Camargo, Tamaulipas		Valadezas, Tamaulipas	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	0.75	0.80			2.00	1.06	0.92	0.91	1.08	1.22
Feb.	1.38	.70			1.02	3.70	.86	2.87	1.02	2.52
Mar.	1.46	.61			1.12	.67	.61	.75	.52	.63
Apr.	.39	1.77			1.69	2.68	1.61	1.57	1.61	1.46
May	4.21	3.40			2.28	6.22	2.25	11.46	2.79	5.87
June	8.15	3.40			2.10	7.01	2.31	8.62	2.87	8.03
July	3.27	1.85	.28	.38			1.36		1.32	3.07
Aug.	8.70	3.30	.51	.26			2.58		2.12	2.80
Sep.	1.65	5.06	.55	1.67			3.94		4.38	5.79
Oct.	1.14	2.59	.08	1.68			2.33		2.17	.24
Nov.	.59	.71	.04	.78			.75		1.03	1.06
Dec.	.24	.53	.63	.39			.84		.83	.75
Yearly	31.93	24.72			15.37		20.36		21.74	33.20
										23.49

Month	Bajo Rio San Juan, Tamps., No. 2-29		Cd. Diaz Ordaz, Tamaulipas		Bajo Rio San Juan, Tamps., No. 2-38		Bajo Rio San Juan, Tamps., No. 2-33		Reynosa, Tamaulipas	
	1987	Average	1987	Average	1987	Average	1987	Average	1987	Average
Jan.	1.42	1.35	2.80	1.23	1.97	1.36	1.65	1.37	3.11	1.24
Feb.	1.65	1.18	3.19	1.20	1.42	.94	1.38	1.00	1.73	1.09
Mar.	.31	.48	.47	.58	.79	.50	.31	.51	.35	.73
Apr.	.55	1.42	1.10	1.47	.71	1.34	.55	1.51	.71	1.22
May	5.51	3.70	8.19	3.01	6.06	3.54	6.61	4.30	6.89	2.90
June	9.92	3.25	6.02	2.83	6.22	3.36	6.93	3.02	6.10	2.37
July	1.46	4.53	1.45			1.79		1.76		1.58
Aug.	2.29	1.34	2.10			3.10		2.76		1.89
Sep.	3.85	6.50	3.71			3.61		3.87		3.61
Oct.	2.36	.75	2.58			2.01		2.27		2.27
Nov.	1.00	1.54	1.14			1.19		1.07		.93
Dec.	1.03	1.34	1.08			1.10		1.14		.96
Yearly		23.37	37.77	22.38		23.84		24.58		20.79

Month	Bajo Rio San Juan, Tamps., No. 3-55		Bajo Rio San Juan, Tamps., No. 3-58		Bajo Rio San Juan, Tamps., No. 3-60		Bajo Rio San Juan, Tamps., No. 3-47		Bajo Rio San Juan, Tamps., No. 3-63	
	1987	Average								
Jan.	3.70	1.82	3.98	1.68	3.31	1.53	2.91	1.78	3.39	1.63
Feb.	1.14	1.60	.87	1.36	1.06	1.25	1.26	1.32	1.18	1.75
Mar.	.79	.66	.63	.61	.47	.58	.63	.59	.59	.55
Apr.	.55	1.81	.75	1.48	.47	1.46	.20	1.49	.35	1.31
May	4.09	2.88	6.02	3.04	5.91	2.89	3.43	3.50	4.06	2.79
June	5.75	3.32	6.85	2.94	7.36	3.30	5.91	3.29	7.80	3.56
July	2.46		2.63			1.96		2.34		1.97
Aug.	2.57		2.47			2.36		2.38		2.77
Sep.	4.31		4.84			4.90		4.17		4.97
Oct.	2.78		2.64			2.71		2.18		2.32
Nov.	.87		.98			.95		.91		.84
Dec.	1.21		1.20			1.24		1.21		1.22
Yearly		26.29		25.87		25.13		25.16		25.68

## RAINFALL ON THE RIO GRANDE WATERSHED

IN MEXICO

IN INCHES

Month	Retamal, Tamaulipas		Bajo Rio San Juan, Tamps., 3-48A					
	1987	Average	1987	Average				
Jan.	3.11	1.12	2.95	2.10				
Feb.	2.20	1.16	1.50	2.36				
Mar.	.59	.63	.67	.63				
Apr.	.43	1.43	.43	.46				
May	2.80	2.77	3.58	3.30				
June	2.83	2.52	5.71	3.67				
July	3.86	1.62		1.88				
Aug.	2.40	2.57		.72				
Sep.	4.76	3.59		4.70				
Oct.	.59	2.43		1.36				
Nov.	1.57	1.18		.86				
Dec.	.79	1.11		2.30				
Yearly	25.93	22.13		24.34				

## AVERAGE RAINFALL ON SUBDIVISIONS OF THE RIO GRANDE WATERSHED

WITH AVERAGES FOR THE 117 YEARS 1871 - 1987, INCLUSIVE

IN INCHES

The precipitation records of all stations on or adjacent to the watershed subdivisions listed below have been used, with proper weighting for area, in calculating the average rainfalls shown here. The drainage area for each subdivision is shown in parentheses. The hundreds of individual records are delineated in the various "Indexes to Precipitation Records" shown in Water Bulletins Nos. 10, 14, 22, 26, and Supplement 40A.

	El Paso to Fort Quitman (2,677 Square Miles)		Fort Quitman to Above Rio Conchos (3,056 Square Miles)		# Above Rio Conchos to Johnson Ranch (3,782 Square Miles)		Johnson Ranch to Foster Ranch (12,982 Square Miles)	
	Month	1987	Period Average	1987	Period Average	1987	Period Average	1987
Jan.	0.18	0.46	0.05	0.40	0.04	0.36	0.03	0.48
Feb.	.41	.37	.45	.27	.25	.28	.66	.37
Mar.	.40	.33	.10	.25	.01	.19	.50	.39
Apr.	.55	.27	1.65	.35	1.04	.41	1.74	.79
May	1.46	.43	1.43	.62	2.19	.80	2.02	1.49
June	1.57	.82	1.99	1.26	1.33	1.20	1.81	1.72
July	.75	2.19	1.15	2.86	2.48	1.86	1.39	1.82
Aug.	1.63	1.87	3.97	2.42	2.87	1.95	2.08	2.07
Sept.	.83	1.45	.90	2.01	1.74	1.65	2.47	2.18
Oct.	.50	.94	.57	1.07	.47	.90	.51	1.26
Nov.	.49	.44	.26	.42	0	.36	.08	.59
Dec.	.96	.59	.46	.54	.36	.42	.72	.55
Yearly	9.73	10.16	12.98	12.47	12.78	10.38	14.01	13.71

	Pecos River below Sheffield (3,390 Square Miles)		# Foster Ranch to Amistad Dam (2,799 Square Miles)		Devils River		+ Amistad Dam to Eagle Pass (1,625 square Miles)	
	Month	1987	Period Average	1987	Period Average	1987	Period Average	1987
Jan.	0.13	0.68	0.03	0.51	0.26	0.68	0.27	0.74
Feb.	2.58	.86	1.66	.65	2.41	.74	2.11	.91
Mar.	1.05	.75	.51	.73	1.16	1.04	1.19	.97
Apr.	1.61	1.81	1.69	1.33	2.32	1.75	2.32	1.71
May	4.02	1.86	4.40	1.99	4.65	2.61	5.53	2.90
June	3.50	2.43	2.55	2.18	4.08	2.65	6.83	2.55
July	.72	1.80	1.64	1.24	2.67	1.77	1.75	1.84
Aug.	3.26	2.00	1.77	1.64	3.30	2.13	2.99	1.92
Sept.	2.35	2.48	1.08	2.31	1.77	2.91	1.12	3.01
Oct.	.77	1.91	.06	1.48	.37	2.25	.09	2.11
Nov.	.14	.92	1.54	.78	.62	1.47	.55	1.05
Dec.	.92	.75	.33	.64	.91	.98	1.00	.87
Yearly	21.05	18.25	17.26	15.48	24.52	20.98	25.75	20.58

	! Eagle Pass to Laredo (3,795 Square Miles)		## Laredo to Falcon Dam (3,369 Square Miles)		## Falcon Dam to Rio Grande City (468 Square Miles)		United States Side below Rio Grande City (986 Square Miles)	
	Month	1987	Period Average	1987	Period Average	1987	Period Average	1987
Jan.	0.68	0.72	1.03	0.78	0.78	0.91	2.52	1.29
Feb.	1.87	.79	1.80	.81	2.01	.86	2.17	1.14
Mar.	.64	.89	.54	.78	.53	.89	.68	1.01
Apr.	1.98	1.63	1.41	1.43	2.58	1.23	.77	1.38
May	3.92	8.12	3.06	3.19	4.62	2.44	3.32	2.85
June	5.38	2.48	3.38	2.05	3.57	2.15	5.21	2.56
July	5.41	1.47	2.48	2.04	2.01	1.86	2.27	1.81
Aug.	3.03	2.25	4.27	1.87	2.00	2.11	.97	2.35
Sept.	.56	2.96	.87	3.00	1.37	3.47	3.75	4.36
Oct.	.34	1.90	1.35	1.72	.26	1.94	.87	2.54
Nov.	.81	.95	.53	1.49	1.39	.80	1.67	1.36
Dec.	.27	.96	.74	.85	.53	.70	.49	1.26
Yearly	24.89	20.12	21.46	20.01	21.65	19.36	24.69	23.91

\* Excluding Rio Conchos, Alamito Creek, and Terlingua Creek      # Excluding Pecos and Devils Rivers

+ Excluding Arroyo Las Vacas, San Felipe Creek, Pinto Creek, Rio San Diego, and Rio San Rodrigo

! Excluding Rio Escondido      \*\* Excluding Rio Salado above old Cd. Guerrero

## Excluding Rio Alamo and Rio San Juan

ISOHYETAL MAP  
FOR YEAR 1987

RIO GRANDE DRAINAGE BASIN  
EL PASO, TEXAS TO THE GULF OF MEXICO  
PRECIPITATION IN INCHES

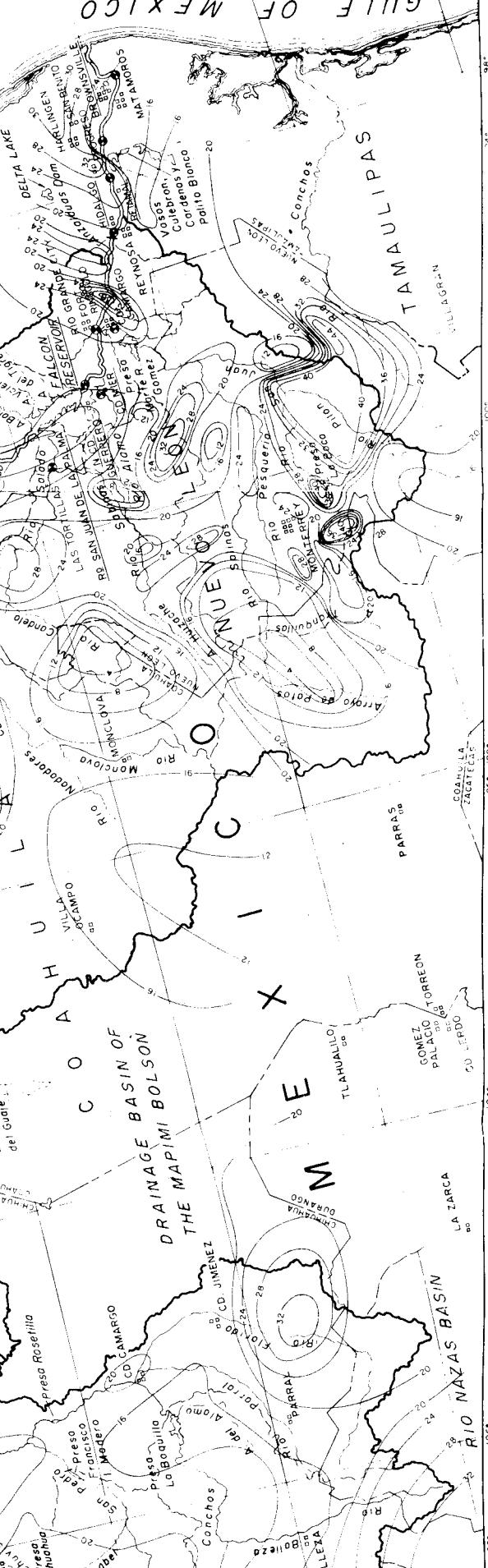
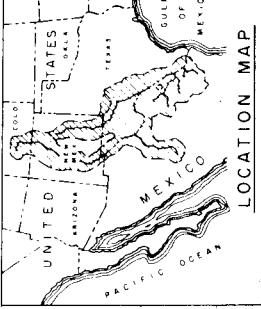
### PRECIPITATION IN INCHES

E G E N D

Stream Gaging Station

NOTE : Evaporation stations located at or near underlined names

LOCATION MAP



## LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

The precipitation records of stations listed below began on the date shown and extend through 1987. For detailed information regarding sources of data, specific periods of record, and other pertinent matters relative to these and additional rainfall stations on the Rio Grande watershed, see "Index to Precipitation Records" in Water Bulletins Nos. 10, 14, 22, 26, and Supplement 40A. With the exception of Las Cruces, New Mexico, all United States precipitation stations listed below are in Texas, while those in Mexico are in the indicated state as shown.

## IN THE UNITED STATES

NAME OF STATION	TYPE GAGE	LATI- TUDE	LONGI- TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Adobes Ranch	S	29° 46'	104° 34'	2,550	# 1950	Fort Quitman - Above Rio Conchos	T. C. Davis
American Dam	S	31° 47'	106° 32'	3,730	# 1938	El Paso - Fort Quitman	I. B. & W. C.
Amistad Dam	R	29° 28'	101° 02'	1,150	July 1962	Foster Ranch - Amistad Dam	I. B. & W. C.
Amistad Reservoir near Comstock	C	29° 33'	101° 13'	1,130	# 1970	Foster Ranch - Amistad Dam	I. B. & W. C.
Apache Ranch	C	27° 56'	99° 56'	500	# 1953	Eagle Pass - Laredo	Ranch Foreman
Baker, A. A. Ranch	R	29° 44'	101° 09'	1,720	July 1962	Devils River	I. B. & W. C.
Bakers Crossing	S	29° 58'	101° 09'	1,520	#Apr. 1955	Devils River	Mrs. Mary Hughey
Big Satan Creek Station	C	29° 40'	100° 58'	1,150	Nov. 1968	Devils River	I. B. & W. C.
Bricker Ranch	S	29° 58'	101° 52'	1,680	May 1952	Johnson Ranch - Langtry	Lena Bricker
Brite, J. G. Ranch	R	29° 33'	101° 01'	1,150	#Sep. 1962	Devils River	I. B. & W. C.
Brotherton Ranch	V	29° 42'	101° 19'	1,400	1961	Foster Ranch - Amistad Dam	Perry Calk
Buoy No. 11	C	29° 31'	101° 10'	**	#Dec. 1969	Foster Ranch - Amistad Dam	I. B. & W. C.
CCWID #11 (Bayview Dist. Off.) Avg. 18 Gages	S	26° 08'	97° 21'	25	# 1952	Lower Rio Grande Valley	CCWID #11
CCWID #19 (Adams Gardens)	S	26° 10'	97° 47'	50	1952	Lower Rio Grande Valley	CCWID # 19
Coal Mine	R	28° 48'	100° 28'	770	#Mar. 1959	Amistad Dam - Eagle Pass	I. B. & W. C.
Comstock	R	29° 41'	101° 10'	1,530	May 1939	Foster Ranch - Amistad Dam	I. B. & W. C.
Continental Ranch	S	29° 51'	101° 18'	1,560	# 1965	Pecos River below Sheffield	Julio Crowder
Corralitos Ranch	C	27° 07'	99° 25'	346	1953	Laredo - Falcon Dam	I. B. & W. C.
Cox Creek near Comstock	C	29° 37'	101° 12'	1,310	#Apr. 1965	Foster Ranch - Amistad Dam	I. B. & W. C.
Crane, Ed Ranch	S	29° 51'	101° 05'	1,630	# 1955	Devils River	Ed Crane
Dead Mans Canyon near Comstock	C	29° 47'	101° 19'	1,320	Sep. 1957	Pecos River below Sheffield	I. B. & W. C.
Devils Lake	R	29° 35'	100° 59'	1,158	#May 1939	Devils River	I. B. & W. C.
Devils River at Cauthorn Ranch	S	30° 05'	101° 07'	1,656	#Apr. 1976	Devils River	I. B. & W. C.
Eagle Pass	S	28° 42'	100° 30'	815	1964	Eagle Pass - Laredo	I. B. & W. C.
Edinburg Filtration Plant	S	26° 18'	98° 10'	100	1952	Lower Rio Grande Valley	City of Edinburg
El Indio	S	28° 31'	100° 19'	725	# 1941	Eagle Pass - Laredo	Glen Stidham
Evans Creek near Comstock	C	29° 32'	101° 06'	1,180	July 1969	Devils River	I. B. & W. C.
Falcon Dam	S	26° 33'	99° 08'	323	Apr. 1950	Laredo - Falcon Dam	I. B. & W. C.
Farias Ranch	R	28° 36'	100° 20'	720	#Mar. 1959	Eagle Pass - Laredo	I. B. & W. C.
Fawcett, H. K. Ranch	C	29° 52'	100° 54'	1,550	# 1941	Devils River	I. B. & W. C.
Feeley	C	29° 34'	101° 07'	1,250	#Apr. 1965	Foster Ranch - Amistad Dam	I. B. & W. C.
Fletcher, H. T. Ranch	S	30° 12'	104° 16'	5,100	# 1939	Alamito Creek	H. Mitchell, Jr.
Fort Hancock Bridge	S	31° 16'	105° 51'	3,500	#Apr. 1940	El Paso Fort Quitman	I. B. & W. C.
Foster, Ross Ranch	C	29° 47'	101° 45'	1,230	May 1961	Johnson Ranch - Foster Ranch	I. B. & W. C.
Garciasville	R	26° 20'	98° 41'	200	#Apr. 1957	Lower Rio Grande Valley	I. B. & W. C.
Gillis Headquarters Ranch	S	29° 37'	100° 47'	1,410	1968	Amistad Dam - Eagle Pass	Jake Schiller
Gillis Ranch	S	29° 41'	101° 03'	1,440	# 1965	Devils River	Walter Gillis
Goldwire Ranch	C	29° 44'	100° 57'	1,695	Nov. 1968	Devils River	I. B. & W. C.
Guayuco Arroyo	R	31° 10'	105° 40'	3,600	#May 1940	El Paso - Fort Quitman	I. B. & W. C.
Harlow Ranch	C	29° 50'	101° 11'	1,695	Mar. 1969	Devils River	I. B. & W. C.
HCWCID #6, Goodwin Pump No. 3	S	26° 16'	98° 24'	175	# 1953	Lower Rio Grande Valley	HCWCID #6
HCWCID #6, Goodwin Pump No. 4B	S	26° 18'	98° 23'	210	# 1953	Lower Rio Grande Valley	HCWCID #6
Huisache Ranch	C	26° 57'	99° 21'	383	Aug. 1953	Laredo - Falcon Dam	I. B. & W. C.
Hutto Ranch No. 1	R	29° 30'	100° 50'	1,240	1964	Devils River	I. B. & W. C.
Hutto Ranch No. 2	R	29° 29'	100° 54'	1,210	1964	Devils River	I. B. & W. C.
Indio Ranch	S	28° 31'	100° 22'	700	1959	Eagle Pass - Laredo	Earnest Scales
James, Lewis Ranch	S	30° 11'	102° 07'	2,275	1966	Johnson Ranch - Foster Ranch	Lewis James
Johnson Ranch	C	29° 01'	103° 23'	2,050	#July 1933	Johnson Ranch - Foster Ranch	I. B. & W. C.
Keisling Farm	S	28° 23'	100° 17'	740	Dec. 1958	Eagle Pass - Laredo	Robert Smith
Kelly, P. W. Ranch	S	29° 46'	101° 12'	1,750	# 1965	Foster Ranch - Amistad Dam	Bobby Kelly
King, Martin Ranch	R	29° 44'	101° 22'	1,460	Nov. 1954	Foster Ranch - Amistad Dam	I. B. & W. C.
La Feria Materials Yard	V	26° 10'	97° 50'	60	# 1960	Lower Rio Grande Valley	HCWCID #3
La Feria Pumping Plant	S	26° 03'	97° 50'	60	# 1952	Lower Rio Grande Valley	HCWCID #3

S Standard  
R Recording  
# Some months missing

C Cumulative

V Visual

\*\* Reservoir surface

## LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

IN THE UNITED STATES

NAME OF STATION	TYPE GAGE	LATI- TUDE	LONG- TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
La Joya	C	26° 15'	98° 29'	150	# 1957	Lower Rio Grande Valley	I. B. & W. C.
La Macolla Farm	S	30° 00'	104° 41'	2,750	Apr. 1977	Fort Quitman - Above Rio Conchos	
La Mota Ranch	S	29° 33'	103° 59'	3,854	# 1943	Alamito Creek	Tom Pelton
Laredo Water Plant	S	27° 33'	99° 31'	410	# 1930	Eagle Pass - Laredo	John Rice
Las Cruces, New Mexico	S	32° 19'	106° 47'	3,893	1975	Caballo Dam - El Paso	Laredo Wtr. Plt.
Las Moras Creek	S	29° 00'	100° 38'	800	1958	Amistad Dam - Eagle Pass	I. B. & W. C.
Lateral No. 12 Headgate	C	28° 51'	100° 34'	800	1959	Amistad Dam - Eagle Pass	Lou McGee
Laughlin Air Force Base	S	29° 21'	100° 47'	1,080	Dec. 1958	Amistad Dam - Eagle Pass	I. B. & W. C.
Lewis, Billie C., Jr.						Amistad Dam - Eagle Pass	U. S. A. F.
Ranch	S	29° 33'	100° 40'	1,400	# 1964	Amistad Dam - Eagle Pass	Billie C.
Line Store	S	30° 40'	100° 57'	2,400	#Oct. 1962	Devils River	Lewis, Jr.
Long Ranch	R	29° 28'	100° 57'	1,140	Oct. 1971	Devils River	C. Lee Conoway
Los Ebanos	C	26° 14'	98° 34'	150	#Apr. 1957	Lower Rio Grande Valley	I. B. & W. C.
Lowry, Cliff Ranch	R	29° 39'	100° 52'	1,490	June 1952	Devils River	I. B. & W. C.
Lowry Ranch No. 2	R	29° 37'	100° 56'	1,160	May 1965	Devils River	I. B. & W. C.
Maverick County Canal						Devils River	
Headgate	S	29° 10'	100° 46'	870	#Mar. 1948	Amistad Dam - Eagle Pass	MCWID #1
Middle Fork San Pedro	C	29° 30'	100° 53'	1,170	#June 1969	Devils River	I. B. & W. C.
Miers, H. T. Ranch Hdqts.	C	29° 44'	100° 51'	1,760	# 1957	Devils River	I. B. & W. C.
Miers, H. T. Ranch No. 2	R	29° 44'	100° 53'	1,600	Apr. 1964	Devils River	I. B. & W. C.
Miller, Eugene Ranch	S	30° 26'	101° 10'	2,150	July 1975	Devils River	Eugene Miller
Mitchell, Kerr Ranch	S	30° 13'	104° 00'	4,450	# 1941	Alamito Creek	Mrs. K. Mitchell
Neely Ranch	S	30° 59'	105° 32'	3,350	#Aug. 1941	Fort Quitman - Above Rio Conchos	Tom Neely
New Mission Pumping Plant	S	26° 11'	98° 24'		#Aug. 1961	Lower Rio Grande Valley	HCWID #14
Normandy	S	28° 55'	100° 36'	780	#Dec. 1958	Amistad Dam - Eagle Pass	Fannin G. Lowe
North Fork San Pedro	C	29° 31'	100° 53'	1,144	June 1969	Devils River	I. B. & W. C.
Owens Ranch	S	30° 45'	101° 40'	2,170	#July 1963	Pecos River below Sheffield	Mrs. W.W. Owens
Pafford Crossing	C	29° 41'	101° 00'	1,180	Feb. 1960	Devils River	I. B. & W. C.
Pecos River near Langtry Station	C	29° 48'	101° 27'	1,260	July 1967	Pecos River below Sheffield	I. B. & W. C.
Penitac (Edinburg Pumping Plant)	S	26° 14'	98° 27'	100	July 1957	Lower Rio Grande Valley	B. Leadbetter
Pinto Creek Station	C	29° 09'	100° 43'	870	#Dec. 1958	Amistad Dam - Eagle Pass	I. B. & W. C.
Presidio, (IB&WC Gage)	S	29° 32'	104° 22'	2,599	#Oct. 1949	Above Rio Conchos - Johnson Ranch	I. B. & W. C.
Prosser Ranch No. 1	C	29° 54'	101° 14'	1,710	Mar. 1965	Pecos River below Sheffield	I. B. & W. C.
Prosser Ranch No. 2	C	29° 59'	101° 16'	1,850	#Mar. 1965	Devils River	I. B. & W. C.
Prosser Ranch No. 3	C	30° 02'	101° 16'	2,020	#Mar. 1965	Pecos River below Sheffield	I. B. & W. C.
Ranchita (Continental)	S	29° 50'	101° 20'	1,540	# 1969	Pecos River below Sheffield	I. B. & W. C.
Redford	C	29° 29'	104° 13'	2,500	July 1954	Above Rio Conchos - Johnson Ranch	Julio Crowder
Rio Grande near Dryden	S	29° 49'	102° 09'	1,350	May 1976	Johnson Ranch - Foster Ranch	I. B. & W. C.
Roma (International Bridge)	S	26° 24'	99° 01'	230	# 1941	Falcon Dam - Rio Grande City	Starr County Bridge Co.
Rough Canyon nr. Del Rio	C	29° 35'	100° 56'	1,147	June 1969	Devils River	I. B. & W. C.
San Benito Pump	S	26° 03'	97° 45'	50	Oct. 1933	Lower Rio Grande Valley	I. B. & W. C.
Sawyer, W. E. Ranch	S	30° 28'	100° 47'	2,100	#July 1966	Devils River	Zane Powers and Kenneth Hayes
Sellers Ranch	C	29° 34'	101° 02'	1,190	#Feb. 1960	Devils River	I. B. & W. C.
Shafter	V	29° 49'	104° 19'	3,920	#July 1968	Above Rio Conchos - Johnson Ranch	Raymond Wylic
Stewart Ranch	R	29° 35'	100° 52'	1,330	#Feb. 1960	Devils River	I. B. & W. C.
Study Butte	S	29° 19'	103° 32'	2,550	July 1977	Terlingua Creek	Shirley Willard
Terlingua Creek Station	C	29° 12'	103° 36'	2,215	Mar. 1952	Above Rio Conchos - Johnson Ranch	I. B. & W. C.
Trees Farm	R	28° 38'	100° 25'	720	#Mar. 1959	Eagle Pass - Laredo	I. B. & W. C.
Van Dalem Farm	C	28° 27'	100° 19'	700	# 1959	Eagle Pass - Laredo	I. B. & W. C.
Vinegarone	C	29° 57'	100° 46'	1,780	May 1966	Devils River	I. B. & W. C.
Walker Ranch	C	29° 50'	101° 14'	1,530	July 1969	Devils River	I. B. & W. C.
Wardlaw Standart Ranch	S	29° 19'	100° 38'	1,070	Apr. 1977	Pinto Creek	Hadly Wardlaw
Whitehead, Tuffy Ranch	R	29° 38'	101° 07'	1,420	July 1962	Devils River	I. B. & W. C.
Yarborough Ranch	S	30° 06'	103° 36'	4,550	# 1966	Johnson Ranch - Foster Ranch	H. D. Smith
Zapata Water Plant	S	26° 54'	99° 16'	380	#May 1953	Laredo Falcon Dam	Zapata Wtr. Plt.
Zuberbueler Ranch	S	29° 41'	101° 14'	1,460	Feb. 1975	Foster Ranch - Amistad Dam	J.U. Zuberbueler

S Standard      R Recording      C Cumulative      V Visual      # Some months or years missing

## LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

## IN MEXICO

NAME OF STATION	TYPE GAGE	LATI- TUDE	LONGI- TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Adjuntas, Nuevo Leon	S	25° 18'	100° 08'	!	# 1958	Rio San Juan	S. A. R. H.
Agualegas, Nuevo Leon	S	26° 18'	99° 33'	!	# 1979	Rio Alamo	S. A. R. H.
Aniego 166, Tamaulipas	C	26° 46'	99° 15'	310	# 1964	Laredo - Falcon Dam	I. B. & W. C.
Apodaca, Nuevo Leon	S	25° 46'	100° 11'	1,330	# Feb. 1964	Rio San Juan	S. A. R. H.
Bachiniva, Chihuahua	S	28° 46'	107° 15'	6,250	# 1952	Adjacent to Rio Conchos	Meteor. Service of Mexico
Balleza, Chihuahua	S	26° 57'	106° 21'	5,870	# 1903	Rio Conchos	Meteor. Service of Mexico
Banderas, Chihuahua	S	31° 01'	105° 35'	!	# 1963	Fort Quitman - Above Rio Conchos	S. A. R. H.
Cabezones, Nuevo Leon	S	24° 59'	99° 45'	!	# 1962	Adjacent to Rio San Juan	S. A. R. H.
Campo Agricola Experi., Chihuahua	S	31° 22'	106° 00'	3,560	# 1958	El Paso - Fort Quitman	I. B. & W. C.
Candela, Coahuila	S	26° 50'	100° 40'	!	# 1970	Rio Salado	S. A. R. H.
Carbonera, Nuevo Leon	S	24° 49'	100° 47'	!	# 1958	Rio San Juan	S. A. R. H.
Carichic, Chihuahua	S	27° 55'	107° 04'	!	# May 1961	Rio Conchos	Meteor. Service of Mexico
Casillas, Nuevo Leon	S	25° 12'	100° 12'	4,060	# 1958	Rio San Juan	S. A. R. H.
Castanos, Coahuila	S	26° 47'	101° 27'	2,440	# 1932	Rio Salado	Meteor. Service of Mexico
Cerralvo, Nuevo Leon	R	25° 05'	99° 37'	1,130	# Nov. 1938	Rio San Juan	S. A. R. H.
Cerritos, Nuevo Leon	S	25° 31'	100° 12'	!	# 1958	Rio San Juan	S. A. R. H.
Cerro Prieto, Nuevo Leon	S	25° 56'	99° 23'	885	# May 1958	Rio San Juan	S. A. R. H.
Chihuahua, Chihuahua	S	28° 38'	106° 04'	4,760	# 1900	Rio Conchos	S. M. N.
Cienega de Flores, Nuevo Leon	R	25° 57'	100° 10'	1,770	# Apr. 1938	Rio San Juan	S. A. R. H.
Cienega del Toro, Nuevo Leon	S	25° 05'	100° 20'	7,010	# 1958	Rio San Juan	S. A. R. H.
Cienega de Purisima, Coahuila	S	25° 20'	100° 32'	!	1980	Rio San Juan	S. A. R. H.
Cd. Acuna, Coahuila	S	29° 20'	100° 57'	900	1951	Amistad Dam - Eagle Pass	I. B. & W. C.
Cd. Anabuac, Nuevo Leon	S	27° 15'	100° 08'	655	1933	Rio Salado	S. A. R. H.
Cd. Camargo, Chihuahua	S	27° 42'	105° 10'	3,950	# Oct. 1957	Rio Conchos	S. A. R. H.
Cd. Camargo, Tamaulipas	S	26° 19'	98° 50'	225	# 1953	Rio San Juan	S. A. R. H.
Cd. Delicias, Chihuahua	S	28° 11'	105° 28'	3,710	# Aug. 1933	Rio Conchos	S. A. R. H.
Cd. Diaz Ordaz, Tamaulipas	S	26° 14'	98° 36'	130	# 1953	Lower Rio Grande Valley	S. A. R. H.
Cd. Guerrero, Chihuahua	S	28° 33'	107° 29'	6,560	# May 1903	Adjacent to Rio Conchos	Meteor. Service of Mexico
Cd. Juarez, Chihuahua	S	31° 44'	106° 28'	3,740	# 1903	El Paso - Fort Quitman	I. B. & W. C.
Cd. Mier, Tamaulipas	S	26° 26'	99° 09'	260	Oct. 1955	Falcon Dam - Rio Grande City	I. B. & W. C.
Cd. Miguel Aleman, Tamaulipas	S	26° 24'	99° 02'	185	1964	Falcon Dam - Rio Grande City	S. A. R. H.
Cd. Reynosa, Tamaulipas	R	26° 05'	98° 19'	130	# 1941	Lower Rio Grande Valley	S. A. R. H.
Cola de Caballo, Nv. Leon	S	25° 41'	100° 25'	!	# 1978	Rio San Juan	S. A. R. H.
Colombia, Nuevo Leon	C	27° 42'	99° 46'	!	# 1964	Eagle Pass - Laredo	I. B. & W. C.
Colombia, Nuevo Leon	S	27° 42'	99° 45'	!	# Sept. 1976	Eagle Pass - Laredo	S. A. R. H.
Colonia Anahuac, Chihuahua	S	28° 29'	106° 44'	6,550	1961	Rio Conchos	Chih. S.A.
Comales, Tamaulipas	R	25° 11'	98° 55'	260	# Mar. 1938	Rio San Juan	S. A. R. H.
Control, Tamaulipas	S	25° 58'	97° 49'	59	# June 1942	Lower Rio Grande Valley	S. A. R. H.
Coyame, Chihuahua	S	29° 28'	105° 06'	!	# Nov. 1961	Rio Conchos	Meteor. Service of Chihuahua
Cuatro Cienegas, Coahuila	S	26° 59'	102° 04'	2,430	# June 1923	Rio Salado	S. A. R. H.
Cuauhtemoc, Chihuahua	S	28° 24'	106° 52'	7,250	# June 1923	Adjacent to Rio Conchos	Meteor. Service of Mexico
Ejido La Rosita, Coahuila	S	28° 27'	103° 18'	3,440	# 1974	Johnson Ranch - Foster Ranch	S. A. R. H.
Ejido Marin, Nuevo Leon	S	25° 50'	100° 00'	!	# Mar. 1979	Rio San Juan	S. A. R. H.
Ejido Reata, Coahuila	S	26° 07'	101° 04'	3,070	# July 1944	Rio Salado	S. A. R. H.
El Cuarenta, Chihuahua	S	30° 33'	105° 50'	!	# 1961	Adjacent to Fort Quitman Above Rio Conchos	Meteor. Service of Chihuahua
El Chuchillo, Nuevo Leon	S	25° 43'	99° 16'	590	# June 1938	Rio San Juan	S. A. R. H.
El Cuervito, Nuevo Leon	S	25° 54'	98° 40'	!	# 1980	Rio San Juan	S. A. R. H.
El Maguey, Chihuahua	S	27° 37'	106° 09'	4,380	# July 1955	Rio Conchos	Meteor. Service of Chihuahua
El Pajonal, Nuevo Leon	S	25° 29'	100° 23'	5,020	# 1958	Rio San Juan	S. A. R. H.
El Realito, Nuevo Leon	S	25° 18'	99° 21'	!	# 1970	Rio San Juan	S. A. R. H.
El Retamal, Tamaulipas	S	26° 02'	98° 02'	82	# Oct. 1949	Lower Rio Grande Valley	I. B. & W. C.
El Ruso, Nuevo Leon	S	24° 42'	100° 26'	6,575	# 1956	Rio San Juan	S. A. R. H.
El Sauzal D.B., Chihuahua	S	31° 35'	106° 18'	3,650	# July 1970	El Paso - Fort Quitman	S. A. R. H.
El Sitio, Chihuahua	S	27° 34'	106° 16'	!	# July 1955	Rio Conchos	Meteor. Service of Chihuahua

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## LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

## IN MEXICO

NAME OF STATION	TYPE GAGE	LATI-TUDE	LONGI-TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
El Vergel, Chihuahua	S	26° 22'	106° 30'	7,350	# 1957	Rio Conchos	Meteor. Service of Mexico
Emiliano Zapata, Coahuila	S	29° 01'	100° 49'	!	#Mar. 1976	Eagle Pass - Laredo	S. A. R. H.
Escalon, Chihuahua	S	26° 45'	104° 20'	4,160	# 1957	Adjacent to Rio Conchos	S. A. R. H.
Esc. Superior de Agricultura, Chihuahua	S	31° 42'	106° 27'	3,690	# 1980	El Paso - Fort Quitman	S. A. R. H.
Espinazo, Nuevo Leon	S	26° 15'	101° 05'	!	# 1980	Rio Salado	S. A. R. H.
Est. Hidron, Tortillas, Tamaulipas	S	26° 50'	99° 33'	365	# 1961	Rio Salado	I. B. & W. C.
Fresnillo, Nuevo Leon	S	26° 26'	99° 53'	!	# 1982	Rio Alamo	S. A. R. H.
Galeana, Nuevo Leon	S	24° 50'	100° 04'	5,430	# 1958	Adjacent to Rio San Juan	Meteor. Service of Mexico
Gallego, Chihuahua	S	29° 50'	106° 23'	5,100	# 1958	Adjacent to Rio Conchos	Meteor. Service of Chihuahua
Garita Km. 28, Chihuahua	S	31° 33'	106° 28'	3,990	#May 1958	El Paso - Fort Quitman	I. B. & W. C.
Garita Km. 26, Tamaulipas	C	27° 17'	99° 37'	!	#Apr. 1961	Laredo - Falcon Dam	I. B. & W. C.
Garza Ayala, Nuevo Leon	S	26° 29'	100° 03'	!	# 1968	Rio Salado	S. A. R. H.
General Bravo, Nuevo Leon	S	25° 48'	99° 11'	590	#Sept. 1906	Rio San Juan	S. A. R. H.
General Cepeda, Coahuila	S	25° 23'	101° 29'	4,920	#Aug. 1926	Rio San Juan	S. A. R. H.
General Trevino, Nv. Leon	S	26° 13'	99° 29'	!	#Oct. 1976	Rio Alamo	S. A. R. H.
Gomez Farías, Coahuila	S	24° 58'	101° 53'	!	#June 1979	Rio San Juan	S. A. R. H.
Guerrero, Coahuila	S	28° 19'	100° 23'	690	#June 1958	Eagle Pass - Laredo	I. B. & W. C.
Hacienda El Alamo, N.Leon	S	26° 29'	99° 46'	!	# 1968	Rio Alamo	I. B. & W. C.
Hacienda Manrique, N.Leon	S	26° 07'	100° 14'	!	#Sept. 1973	Rio San Juan	S. A. R. H.
Hda. San Miguel, Coahuila	S	29° 13'	101° 30'	!	# 1961	Foster Ranch - Amistad Dam	I. B. & W. C.
Hidalgo del Parral, Chihuahua	S	26° 56'	105° 39'	5,740	!	Rio Conchos	Meteor. Service of Mexico
Higueras, Nuevo Leon	S	25° 58'	100° 01'	1,640	#Sept. 1906	Rio San Juan	Meteor. Service of Mexico
Hipolito, Coahuila	S	25° 42'	101° 24'	!	# 1980	Rio San Juan	S. A. R. H.
Huachichil, Coahuila	S	25° 12'	100° 50'	!	# 1980	Rio San Juan	S. A. R. H.
Huizachal, Coahuila	S	25° 42'	100° 57'	!	# 1982	Rio San Juan	S. A. R. H.
Icamole, Nuevo Leon	S	25° 55'	100° 43'	4,900	# 1958	Rio San Juan	S. A. R. H.
Jarita, Nuevo Leon	C	27° 26'	99° 48'	680	#Mar. 1961	Laredo - Falcon Dam	S. A. R. H.
Jimenez, Chihuahua	S	27° 08'	104° 55'	4,490	# 1951	Rio Conchos	S. A. R. H.
Jimenez, Coahuila	S	29° 04'	100° 40'	810	# 1951	Amistad Dam - Foster Ranch	I. B. & W. C.
Km. 135, Chihuahua	S	28° 22'	105° 37'	3,940	# 1962	Rio Conchos	S. A. R. H.
La Amistad, Coahuila	S	29° 27'	101° 05'	!	Feb. 1977	Amistad Dam - Eagle Pass	I. B. & W. C.
La Arena, Nuevo Leon	S	25° 46'	100° 01'	!	# 1968	Rio San Juan	S. A. R. H.
La Boquilla, Chihuahua	S	27° 32'	105° 25'	4,330	# 1910	Rio Conchos	Elec. Industry of Mexico
La Cruz, Nuevo Leon	S	25° 28'	100° 26'	!	# 1958	Rio San Juan	S. A. R. H.
La Escondida, Nuevo Leon	S	25° 16'	99° 45'	!	# 1979	Rio San Juan	S. A. R. H.
La Huasteca, Nuevo Leon	S	25° 30'	100° 30'	!	# 1978	Rio San Juan	S. A. R. H.
La Pomona, Nuevo Leon	S	26° 59'	99° 12'	!	#Mar. 1979	Rio San Juan	S. A. R. H.
La Popa, Nuevo Leon	S	26° 10'	100° 50'	3,230	# 1958	Rio San Juan	S. A. R. H.
La Trasquila, Chihuahua	S	29° 08'	107° 08'	!	# 1962	Adjacent to Rio Conchos	S. A. R. H.
Laguna de Salinillas, Nuevo Leon	S	27° 26'	100° 23'	750	# 1940	Rio Salado	S. A. R. H.
Laguna de Sanchez, Nv. Leon	R	25° 22'	100° 17'	6,500	#Apr. 1941	Rio San Juan	S. A. R. H.
Lampazos, Nuevo Leon	S	27° 02'	100° 30'	1,120	# 1958	Rio Salado	S. A. R. H.
Las Burras, Chihuahua	S	28° 31'	105° 26'	3,590	#July 1949	Rio Conchos	S. A. R. H.
Las Comitadas, Nuevo Leon	S	25° 30'	100° 24'	1,670	# 1940	Rio San Juan	S. A. R. H.
Las Encaramadas, Nuevo Leon	S	25° 30'	99° 31'	730	#Sept. 1926	Rio San Juan	S. A. R. H.
Las Virgenes, Chihuahua	S	28° 10'	105° 38'	4,070	# 1943	Rio Conchos	S. A. R. H.
Lazaro Cardenas, Chih.	S	28° 23'	105° 37'	3,940	# 1961	Rio Conchos	Meteor. Service of Mexico
Linares, Nuevo Leon	R	24° 52'	99° 34'	1,180	# 1900	Adjacent to Rio San Juan	S. A. R. H.
Los Barriles, Chihuahua	S	30° 55'	105° 45'	4,860	July 1958	El Paso - Fort Quitman	I. B. & W. C.
Los Herreras (La Tableta), Nuevo Leon	R	25° 54'	99° 24'	820	#Sept. 1939	Rio San Juan	S. A. R. H.
Los Ramones, Nuevo Leon	R	25° 42'	99° 38'	260	#Sept. 1939	Rio San Juan	S. A. R. H.
Maclovio Herrera, Chihuahua	S	29° 04'	105° 09'	3,220	# 1924	Rio Conchos	Meteor. Service of Mexico
Madero (Los Aldamas), Nuevo Leon	S	26° 02'	99° 12'	!	#May 1970	Rio San Juan	S. A. R. H.
Maijoma, Chihuahua	S	28° 55'	104° 21'	4,270	#Aug. 1955	Rio Conchos	Meteor. Service of Chihuahua
Majalca, Chihuahua	S	28° 53'	106° 21'	6,860	June 1963	Rio Conchos	Meteor. Service of Mexico

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IN MEXICO

NAME OF STATION	TYPE GAGE	LATI- TUDE	LONGI- TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Manuel Benavides, Chihuahua	S	29° 06'	103° 54'	!	#Oct. 1961	Above Rio Conchos - Johnson Ranch	Meteor. Service of Chihuahua
Meoqui, Chihuahua	S	28° 16'	105° 29'	3,790	1961	Rio Conchos	Meteor. Service of Chihuahua
Mier Km. 8, Carr. 12 Tamaulipas	C	26° 23'	99° 14'	!	1962	Rio Alamo	I. B. & W. C.
Mimbres, Nuevo Leon	S	24° 58'	100° 16'	!	# 1958	Rio San Juan	S. A. R. H.
Mina, Nuevo Leon	S	26° 00'	100° 32'	!	# 1958	Rio San Juan	S. A. R. H.
Montemorelos, Nuevo Leon	S	25° 12'	99° 50'	1,420	#Aug. 1904	Rio San Juan	S. A. R. H.
Monterrey, Nuevo Leon	S	25° 40'	100° 18'	1,740	# 1896	Rio San Juan	S. A. R. H.
Muzquiz, Coahuila	S	27° 53'	101° 31'	1,650	# 1923	Rio Salado	S. A. R. H.
Nonoava, Chihuahua	S	27° 29'	106° 44'	!	# 1963	Rio Conchos	Meteor. Service of Chihuahua
Nueva Cd. Guerrero, Tamps.	S	26° 34'	99° 14'	350	#May 1954	Laredo - Falcon Dam	I. B. & W. C.
Nuevo Laredo, Tamaulipas	S	27° 30'	99° 30'	430	# 1950	Eagle Pass - Laredo	I. B. & W. C.
Nuevo Laredo, Tamaulipas	S	27° 30'	99° 30'	430	# 1909	Eagle Pass - Laredo	I. B. & W. C.
Ojinaga, Chihuahua	S	29° 34'	104° 24'	2,590	#Apr. 1954	Rio Conchos	I. B. & W. C.
Ojinaga, Chihuahua	S	29° 34'	104° 24'	2,625	#Nov. 1906	Rio Conchos	Meteor. Service of Mexico
Ocampo, Coahuila	S	27° 19'	102° 24'	3,770	#May 1960	Rio Salado	S. A. R. H.
Ojo Caliente, Chihuahua	S	27° 41'	105° 12'	4,010	1942	Rio Conchos	S. A. R. H.
Ojo de Agua (Sabinas), Nuevo Leon	S	26° 30'	100° 11'	!	1980	Rio Salado	S. A. R. H.
Palestina, Coahuila	S	29° 09'	100° 59'	1,080	# 1931	Rio San Diego	S. A. R. H.
Paras, Nuevo Leon	S	26° 30'	99° 31'	541	# 1958	Rio Alamo	S. A. R. H.
Parrita, Chihuahua	S	29° 25'	106° 29'	!	# 1958	Adjacent to Rio Conchos	S. A. R. H.
Piedras Negras, Coahuila	S	26° 43'	100° 31'	820	# 1951	Amistad Dam - Eagle Pass	Meteor. Service of Mexico
Pobladores, Nuevo Leon	S	25° 31'	99° 24'	!	# 1982	Rio San Juan	S. A. R. H.
Porvenir, Chihuahua	S	31° 14'	105° 52'	3,530	# 1958	El Paso - Fort Quitman	I. B. & W. C.
Posta Zootenica, Chihuahua	S	28° 41'	106° 04'	4,740	# 1957	Rio Conchos	Meteor. Service of Mexico
Potrero de Abrego, Coah.	S	25° 17'	101° 21'	!	1980	Rio San Juan	S. A. R. H.
Presa Amistad, Coahuila	R	29° 26'	101° 02'	920	1969	Amistad - Eagle Pass	I. B. & W. C.
Presa Cabeceras, Coahuila	S	29° 02'	101° 05'	!	# 1964	Amistad Dam - Eagle Pass	S. A. R. H.
Presa Centenario, Coah.	S	29° 13'	100° 57'	!	# 1964	Arroyo Las Vacas	S. A. R. H.
Presa Chihuahua, Chih.	S	28° 34'	106° 10'	5,230	Oct. 1961	Rio Conchos	S. A. R. H.
Presa Luis L. Leon, Chih.	S	28° 57'	105° 17'	!	Oct. 1964	Rio Conchos	S. A. R. H.
Presa Rodrigo Gomez, Nuevo Leon	S	25° 25'	100° 07'	1,460	# 1923	Rio San Juan	S. A. R. H.
Presa San Miguel, Coah.	S	29° 02'	100° 57'	1,000	# 1964	Rio San Diego	S. A. R. H.
Presa V. Carranza, Coah.	S	27° 31'	100° 37'	790	#June 1927	Rio Salado	S. A. R. H.
Progreso, Coahuila	S	27° 25'	101° 00'	1,210	#Feb. 1943	Rio Salado	S. A. R. H.
Ramos Arizpe, Coahuila	S	25° 32'	100° 57'	4,590	#Apr. 1907	Rio San Juan	Meteor. Service of Mexico
Rancho La Bandera, Tamps.	C	26° 42'	99° 22'	!	1962	Laredo - Falcon Dam	I. B. & W. C.
Rancho San Diego, Coah.	S	28° 03'	100° 35'	!	#May 1959	Eagle Pass - Laredo	I. B. & W. C.
Rancho Vidrios, Tamps.	C	27° 35'	99° 37'	450	#Sept. 1956	Eagle Pass - Laredo	I. B. & W. C.
Rayones, Nuevo Leon	S	25° 01'	100° 05'	1,970	#Oct. 1926	Rio San Juan	S. A. R. H.
Rinconada, Nuevo Leon	S	25° 41'	100° 42'	4,790	#Apr. 1944	Rio San Juan	S. A. R. H.
Rio Salado Hwy. 85, N. Leon	S	26° 53'	99° 49'	390	#May 1958	Rio Salado	I. B. & W. C.
Rio Salado Riberona, Tamps.	S	26° 48'	99° 25'	330	#July 1964	Laredo - Falcon Dam	I. B. & W. C.
Rosario, Durango	S	26° 30'	105° 38'	!	1962	Rio Conchos	S. A. R. H.
Sabinas, Coahuila	S	27° 51'	101° 07'	1,120	#May 1922	Rio Salado	S. A. R. H.
Sabinas Hidalgo, Nv. Leon	S	26° 30'	100° 10'	1,030	#May 1958	Rio Salado	I. B. & W. C.
Saltillo, Coahuila	S	25° 26'	101° 00'	5,280	# 1886	Rio San Juan	S. A. R. H.
Samalayuca, Chihuahua	S	31° 21'	106° 28'	4,180	1958	El Paso - Ft. Quitman	Meteor. Service of Mexico
San Antonio, Durango	S	26° 25'	105° 21'	5,430	# 1943	Rio Conchos	S. A. R. H.
San Antonio de Las Alazanas, Coahuila	S	25° 16'	100° 35'	!	# 1958	Rio San Juan	S. A. R. H.
San Diego, Nuevo Leon	S	25° 14'	99° 15'	!	#Feb. 1978	Rio San Juan	S. A. R. H.
San Fernando, Coahuila	S	29° 25'	101° 43'	!	Aug. 1961	Foster Ranch - Amistad Dam	I. B. & W. C.
San Ignacio, Tamaulipas	C	27° 04'	99° 28'	!	# 1964	Laredo - Falcon Dam	I. B. & W. C.
San Javier, Nuevo Leon	C	26° 16'	99° 25'	!	1962	Rio Alamo	I. B. & W. C.
San Juan de Vaqueria, Coahuila	S	25° 15'	101° 13'	!	# 1980	Rio San Juan	S. A. R. H.
San Juanito, Chihuahua	S	27° 58'	107° 36'	!	# 1959	Adjacent to Rio Conchos	Meteor. Service of Mexico
San Nicolas, Nuevo Leon	S	25° 45'	100° 17'	!	# 1978	Rio San Juan	S. A. R. H.
San Rafael Bustamante, Tamaulipas	C	26° 54'	99° 30'	!	#Nov. 1967	Rio Salado	I. B. & W. C.
Santa Catarina, Nv. Leon	R	25° 40'	100° 29'	2,230	#Oct. 1937	Rio San Juan	S. A. R. H.
Sierra Mojada, Coahuila	S	27° 17'	103° 42'	4,120	# 1897	Adjacent to Johnson Ranch - Foster Ranch	S. A. R. H.

S Standard      R Recording      C Cumulative      ! Not available      # Some months or years missing

## LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

## IN MEXICO

NAME OF STATION	TYPE GAGE	LATI-TUDE	LONGI-TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Stas. - Bajo Rio Bravo							
# 1 - 18	S	25° 49'	97° 42'	!	1964	Lower Rio Grande Valley	S. A. R. H.
# 2 - 6	S	25° 44'	97° 53'	!	1964	Lower Rio Grande Valley	S. A. R. H.
# 3 - 14	S	25° 56'	97° 59'	!	1964	Lower Rio Grande Valley	S. A. R. H.
# 3 - 15	S	25° 46'	98° 01'	!	1964	Lower Rio Grande Valley	S. A. R. H.
# 3 - 17	S	25° 49'	97° 58'	!	1964	Lower Rio Grande Valley	S. A. R. H.
Stas. - Bajo Rio San Juan							
# 2 - 29	S	26° 10'	98° 38'	!	1964	Lower Rio Grande Valley	S. A. R. H.
# 2 - 33	S	26° 10'	98° 28'	!	1964	Lower Rio Grande Valley	S. A. R. H.
# 2 - 38	S	26° 06'	98° 34'	!	1964	Lower Rio Grande Valley	S. A. R. H.
# 3 - 47	S	25° 58'	98° 07'	!	1964	Lower Rio Grande Valley	S. A. R. H.
# 3 - 48 A	S	25° 52'	98° 05'	92	1964	Lower Rio Grande Valley	S. A. R. H.
# 3 - 55	S	25° 52'	98° 12'	!	1964	Lower Rio Grande Valley	S. A. R. H.
# 3 - 58	S	25° 50'	98° 11'	!	1964	Lower Rio Grande Valley	S. A. R. H.
# 3 - 60	S	25° 46'	98° 10'	!	1964	Lower Rio Grande Valley	S. A. R. H.
# 3 - 63	S	25° 41'	98° 06'	!	1964	Lower Rio Grande Valley	S. A. R. H.
Tepehuaje, Nuevo Leon	S	25° 32'	100° 15'	!	#June 1979	Rio San Juan	S. A. R. H.
Topo Chico, Nuevo Leon	R	25° 44'	100° 20'	1,640	#Aug. 1939	Rio San Juan	S. A. R. H.
Tunel San Fco., Nv. Leon	S	25° 25'	100° 10'	!	# 1958	Rio San Juan	S. A. R. H.
Una de Gato, Nuevo Leon	S	25° 58'	99° 41'	!	# 1979	Rio San Juan	S. A. R. H.
Vado de Cedillos, Chih.	S	31° 13'	105° 48'	3,500	#Apr. 1958	El Paso - Fort Quitman	I. B. & W. C.
Valadeces, Tamaulipas	S	26° 14'	98° 40'	!	1964	Lower Rio Grande Valley	S. A. R. H.
Vallecillo, Nuevo Leon	S	26° 40'	99° 59'	900	#June 1958	Rio Salado	S. A. R. H.
Valle Allende, Chihuahua	S	26° 56'	105° 23'	!	#Mar. 1962	Rio Conchos	Meteor. Service of Chihuahua
Vaqueria, Nuevo Leon	S	25° 08'	99° 04'	!	#Mar. 1979	Rio San Juan	S. A. R. H.
Villa Aldama, Chihuahua	S	28° 50'	105° 55'	4,140	1961	Rio Conchos	Meteor. Service of Mexico
Villaldama, Nuevo Leon	S	26° 30'	100° 25'	1,540	#Apr. 1979	Rio Salado	Meteor. Service of Mexico
Villa Allende, Nuevo Leon	S	25° 17	100° 01'	2,210	#Nov. 1938	Rio San Juan	S. A. R. H.
Villa Coronado, Chihuahua	S	26° 44'	105° 08'	4,790	#Aug. 1964	Rio Conchos	S. A. R. H.
Villa Hidalgo, Coahuila	S	27° 47'	99° 52'	660	1951	Eagle Pass - Laredo	I. B. & W. C.
Zaragoza, Coahuila	S	28° 29'	100° 55'	1,210	#Aug. 1977	Eagle Pass - Laredo	S. A. R. H.

S Standard

R Recording

C Cumulative

! Not available

# Some months or years missing

## EVAPORATION IN THE RIO GRANDE BASIN

IN THE UNITED STATES

IN INCHES

Tabulated below are records of evaporation observed at eight stations in Texas operated by the United States Section of the Commission from Presidio to Brownsville. At all stations, the exposure to wind was uniform and relatively unimpeded. The sites were kept cleared of all high brush and trees within 150 feet, and all brush, tall weeds, and other obstructions within 100 feet of the fenced enclosures. Within the enclosures all vegetation has been eradicated or kept trimmed to within 3 inches of the ground surface. For specific location of these stations, refer to data opposite same station name shown in "Location of Rainfall Stations on the Rio Grande Watershed," pages 123 and 124 in this bulletin.

Records were obtained by means of:

1. Standard National Weather Service pan. A circular pan, 4 feet in diameter and 10 inches deep, made of 22-gage galvanized iron, is set on a wooden platform with the rim of the pan 16 inches above the ground. The water level is maintained between 2 and 3 inches below the rim of the pan and is measured with a micrometer gage. This type of pan was in operation at Amistad Dam and Falcon Dam.

2. A circular pan, 2 feet in diameter and 36 inches deep, made of 22-gage galvanized iron, is set in the ground with the rim of the pan 3 inches above the ground surface and the top covered with a circular screen of No. 4 (1/4" mesh) galvanized hardware cloth. The water level is maintained between 2.5 and 3.5 inches below the rim of the pan. This type of pan was in operation at Falcon Dam. This same type of pan, equipped with an automatic feed tank that maintains the water at a level 3 inches below the rim of the pan, was in operation at Martin King Ranch and Eagle Pass.

3. An evaporometer, developed by the United States Section of the Commission and calibrated against a 2-foot pan described above, was in operation at Presidio, Johnson Ranch, Long Ranch, and at a site 7 miles east of Brownsville.

Month	Presidio		Johnson Ranch		Martin King Ranch		Long Ranch		Amistad Dam	
	1987	Average 1950-1987	1987	Average 1950-1987	1987	Average 1956-1987	1987	Average 1971-1987	1987	Average 1963-1987
Jan.	1.94	3.60	4.32	3.30	3.00	3.10	2.16	2.20	3.43	3.70
Feb.	3.43	4.90	4.32	4.80	3.00	3.60	1.94	2.70	3.60	4.70
Mar.	5.06	7.70	6.60	8.00	4.69	6.10	4.09	4.50	6.41	8.10
Apr.	4.37	9.40	9.57	10.00	5.68	7.50	4.09	5.60	7.78	10.00
May	4.81	10.80	8.56	11.40	5.29	8.20	3.35	5.70	7.39	10.70
June	6.46	11.70	10.30	11.60	6.25	9.80	4.47	7.10	9.03	12.60
July	6.46	11.10	10.38	11.70	10.85	11.30	6.46	8.40	11.03	14.60
Aug.	5.37	10.20	9.03	10.60	10.60	10.70	6.91	7.80	12.75	13.50
Sep.	4.18	8.50	8.37	8.60	6.93	7.90	4.54	6.00	8.71	9.90
Oct.	3.75	6.70	7.54	6.80	6.65	5.60	4.39	4.00	13.68	7.50
Nov.	2.18	4.60	2.20	4.30	4.39	3.80	2.53	2.80	9.80	5.00
Dec.	1.87	3.40	3.26	3.20	3.45	3.10	2.24	2.20	3.09	3.60
Total	49.88	92.60	84.45	94.30	70.78	80.70	47.17	59.00	96.70	103.90

Month	Eagle Pass		Falcon Dam * 2-Foot Pan		Falcon Dam 4-Foot Pan		Brownsville	
	1987	Average 1964-1987	1987	Average 1950-1987	1987	Average 1956-1987	1987	Average 1986-1987
Jan.	2.68	3.20	4.12	3.40	3.94	3.90	2.63	2.90
Feb.	2.12	3.50	4.40	4.30	5.16	5.20	3.27	3.60
Mar.	3.88	5.60	5.28	6.50	6.12	8.20	4.24	4.90
Apr.	6.09	7.10	6.73	8.10	8.06	10.10	5.55	6.00
May	5.67	7.40	7.38	9.10	9.36	11.40	6.11	5.90
June	6.10	9.50	10.04	10.60	10.12	13.10	4.96	6.40
July	9.86	11.00	19.68	12.60	14.04	15.10	5.47	7.30
Aug.	12.91	10.40		11.30	15.37	13.50	6.51	7.00
Sep.	6.77	7.80		8.10	10.10	9.90	7.66	5.50
Oct.	6.34	6.10		6.40	9.18	7.40	8.12	4.90
Nov.	5.13	4.20		4.80	5.51	5.30	5.12	3.90
Dec.	3.64	3.40		3.70	3.87	3.90	2.99	3.00
Total	71.19	79.20		88.90	100.83	107.00	62.63	61.30

\* Discontinued July 1987

## EVAPORATION IN THE RIO GRANDE BASIN

IN MEXICO

IN INCHES

Tabulated below are records of evaporation observed at ten stations operated and maintained by the Mexican Section of the Commission. Nine stations are along the Rio Grande from Cd. Juarez, Chihuahua to Retamal, Tamaulipas, and one is located on the Rio Conchos near Ojinaga, Chihuahua. At all stations, except Ojinaga, the sites were kept cleared of all high brush and trees within 150 feet, and of all brush and tall weeds within 100 feet of the fenced enclosures. The Ojinaga station is 30 feet landward of the east Rio Conchos levee with a concrete V-shaped irrigation ditch and road between the levee and the 8 x 8-meter woven wire pen, which encloses a 150-cm evaporation pan and a 70 x 50-cm shelter with thermometers. Inside the enclosures, all vegetation has been eradicated or kept trimmed to within 3 inches of the ground surface. The exposure to wind was uniform and relatively unimpeded. For specific location of these stations, refer to data opposite same station name shown in "Location of Rainfall Stations on the Rio Grande Watershed."

The type of pan used at all these stations was a standard National Weather Service-type pan, 4 feet in diameter and 10 inches deep, made of 22-gage galvanized iron, set on a wooden platform with the rim of the pan 16 inches above the ground. The water level was maintained between 2 and 3 inches below the rim of the pan and was measured with a micrometer gage.

Data for other evaporation stations in the Rio Grande basin in Mexico, which were operated by various Mexican agencies, are available in Water Bulletin No. 57 published by the Mexican Section of the Commission.

	Cd. Juarez, Chihuahua		Ojinaga, Chihuahua		Cd. Acuna, Coahuila		La Amistad, Coahuila		Jimenez, Coahuila	
Month	1987	# Average 1969-1987	1987	# Average 1954-1987	1987	# Average 1951-1987	1987	# Average 1977-1987	1987	# Average 1951-1987
Jan.	3.31	3.60	2.40	3.42	2.83	3.27	2.95	3.52	4.37	3.63
Feb.	3.31	4.49	4.26	4.86	3.31	4.42	3.35	4.65	4.76	4.68
Mar.	6.30	7.74	6.02	8.25	5.20	7.51	5.55	7.37	6.57	7.37
Apr.	8.46	9.68	6.26	10.48	6.54	8.67	6.50	9.49	7.52	8.15
May	9.17	11.12	7.91	12.52	6.65	9.55	4.96	9.66	7.17	9.09
June	12.36	12.02	8.86	13.10	7.17	11.24	6.97	11.35	8.07	10.86
July	12.52	10.89	9.25	12.79	10.08	12.91	9.80	13.68	10.47	12.41
Aug.	8.78	9.60	8.50	10.98	10.35	11.75	10.83	12.96	12.44	11.45
Sept.	7.56	7.91	7.01	8.56	6.85	8.49	7.20	9.87	8.50	8.40
Oct.	6.79	6.04	4.76	6.59	5.67	5.98	5.94	7.25	8.39	5.96
Nov.	4.37	4.15	2.72	4.17	3.43	3.79	3.66	4.70	4.72	3.91
Dec.	2.76	3.12	2.32	3.24	2.56	2.95	2.80	3.43	4.33	3.25
Total	84.69	90.36	70.27	98.96	70.64	90.53	70.51	97.94	87.31	89.16

	Villa Hidalgo, Coahuila		Nuevo Laredo, Tamaulipas		Nueva Cd. Guerrero, Tamaulipas		Cd. Mier, Tamaulipas		Retamal, Tamaulipas	
Month	1987	# Average 1951-1987	1987	# Average 1964-1987	1987	# Average 1954-1987	1987	# Average 1955-1987	1987	# Average 1951-1987
Jan.	2.99	3.68	2.52	4.21	2.91	3.30	3.23	3.52	3.90	3.87
Feb.	3.50	4.88	3.54	5.38	3.78	4.24	4.13	4.74	3.78	4.52
Mar.	4.69	7.44	4.65	8.90	4.96	7.13	4.92	7.71	5.00	6.56
Apr.	7.60	9.27	7.28	10.87	7.05	8.62	7.32	9.33	6.46	7.72
May	7.44	10.55	7.32	11.84	7.48	9.89	8.39	10.42	6.61	8.17
June	9.33	12.53	9.29	13.66	8.94	11.29	9.69	12.01	6.97	8.84
July	10.35	14.29	10.43	15.36	11.06	12.95	12.09	13.80	9.17	9.82
Aug.	12.87	13.14	11.77	14.18	11.69	12.07	12.36	12.38	9.33	9.61
Sept.	8.94	9.56	7.44	10.58	7.64	8.73	7.99	9.43	8.58	7.40
Oct.	7.64	7.16	6.65	7.95	6.97	6.47	6.85	7.18	6.57	6.03
Nov.	4.29	4.67	3.90	5.42	4.09	4.52	4.17	4.76	4.02	4.35
Dec.	3.58	3.56	2.60	4.14	2.68	3.28	----	3.57	2.91	3.75
Total	83.22	100.73	77.39	112.49	79.25	92.49	----	98.85	73.30	80.64

# Some months missing

## TEMPERATURE, HUMIDITY, AND WIND

The maximum and minimum temperatures shown for the stations in Mexico are from daily maximum and minimum thermometer observations. The mean monthly temperatures are averages of these daily maximum and minimum temperatures.

The mean monthly temperatures and relative humidities shown for stations in the United States were integrated from continuous records of hygrothermographs, housed in louvered shelters, with the sensing elements of the instruments 16 inches above the ground and 9 feet southwest of either a 2 or 4-foot diameter evaporation pan. The maximum and minimum temperatures shown below are the extreme temperatures for the month as recorded on the charts except for Falcon Dam and Amistad Dam, where the readings are based on daily maximum and minimum thermometer observations.

Monthly mean wind velocities are based on the total miles of wind movement indicated by a standard 3-cup anemometer installed and operated according to specifications for a Class A National Weather Service evaporation station.

## TEMPERATURE - DEGREES IN FAHRENHEIT

## IN THE UNITED STATES

Month	Amistad Dam, Texas				Eagle Pass, Texas				Falcon Dam, Texas			
	Mean 1987	Average March 1963-1987	1987		Mean 1987	# Average 1964-1987	1987		Mean 1987	# Average July 1950-1987	1987	
			Max.	Min.			Max.	Min.			Max.	Min.
Jan.	50.8	49.9	81	27	52.1	50.8	83	25	40.1	54.4	84	31
Feb.	54.8	53.8	81	39	56.2	55.5	83	37	51.9	59.1	84	41
Mar.	56.9	62.6	81	33	58.7	64.5	82	34	53.9	66.7	87	42
Apr.	64.9	71.0	99	34	68.6	69.8	100	35	63.4	74.5	100	30
May	72.6	72.6	91	60	74.6	77.7	90	51	80.1	79.8	95	61
June	78.1	81.9	97	61	79.1	82.8	98	62	87.4	83.7	98	67
July	82.0	84.6	99	66	81.9	85.9	99	69	88.0	85.5	103	70
Aug.	84.9	84.1	102	66	85.8	85.5	105	69	86.8	85.1	106	70
Sept.	78.9	78.9	96	59	79.8	79.9	102	56	83.7	80.4	103	60
Oct.	71.6	70.0	91	52	72.1	70.8	95	54	76.2	73.0	97	57
Nov.	59.9	59.9	88	33	61.4	60.8	91	32	65.2	63.6	90	40
Dec.	53.4	52.2	83	30	54.1	53.6	85	30	59.9	57.0	87	37
Yearly	67.4	68.5	102	27	68.7	69.8	105	25	69.7	71.9	106	30

## IN MEXICO

Month	Cd. Juarez, Chihuahua				Ojinaga, Chihuahua				La Amistad, Coahuila			
	Mean 1987	# Average July 1960-1987	1987		Mean 1987	# Average April 1954-1987	1987		Mean 1987	# Average 1977-1987	1987	
			Max.	Min.			Max.	Min.			Max.	Min.
Jan.	44.6	46.4	75	16	46.4	50.0	82	16	53.6	51.8	81	27
Feb.	50.0	51.8	75	41	51.8	55.4	81	43	57.2	55.4	84	36
Mar.	53.6	57.2	79	21	57.2	62.6	86	25	59.0	62.6	84	34
Apr.	62.6	64.4	93	37	62.6	68.0	100	27	68.0	71.6	100	36
May	71.6	71.6	91	48	71.6	78.8	99	48	75.2	78.8	95	52
June	80.6	80.6	106	61	82.4	86.0	109	52	80.6	84.2	99	63
July	82.4	84.2	104	64	84.2	87.8	109	64	84.2	86.0	102	70
Aug.	80.6	82.4	100	61	84.2	86.0	106	63	87.8	89.6	106	68
Sept.	73.4	73.4	95	54	77.0	78.8	102	54	80.6	80.6	100	59
Oct.	69.8	66.2	91	50	69.8	69.8	97	48	73.4	71.6	97	54
Nov.	55.4	53.6	82	37	66.0	59.0	90	45	62.6	62.6	95	36
Dec.	44.6	48.2	77	57	59.0	51.8	84	34	57.2	55.4	90	27
Yearly	64.4	62.6	106	16	68.0	64.4	109	16	69.8	64.4	106	27

Month	Cd. Acuna, Coahuila				Jimenez, Coahuila				Piedras Negras, Coahuila			
	Mean 1987	# Average April 1951-1987	1987		Mean 1987	# Average March 1951-1987	1987		Mean 1987	# Average April 1951-1987	1987	
			Max.	Min.			Max.	Min.			Max.	Min.
Jan.	46.4	50.0	79	21	51.8	55.4	82	23	51.8	53.6	84	25
Feb.	51.8	55.4	81	34	57.2	57.2	84	37	55.4	57.2	84	39
Mar.	55.4	62.6	79	27	59.0	62.6	82	34	59.0	64.4	82	30
Apr.	62.6	69.8	97	34	66.2	71.6	84	36	68.0	73.4	100	34
May	73.4	77.0	91	54	77.0	75.2	93	50	77.0	78.8	91	52
June	77.0	82.4	99	59	80.6	82.4	99	61	73.4	84.2	99	52
July	80.6	86.0	97	64	84.2	86.0	100	70	84.2	87.8	102	68
Aug.	82.4	86.0	100	64	87.8	86.0	104	64	80.6	86.0	106	68
Sept.	77.0	78.8	97	54	80.6	78.8	100	57	80.6	80.6	102	61
Oct.	69.8	69.8	91	48	73.4	69.8	93	52	73.4	69.8	93	52
Nov.	57.2	59.0	86	37	60.8	60.8	90	32	60.8	60.8	90	28
Dec.	50.0	51.8	88	21	55.4	55.4	93	27	55.4	55.4	93	28
Yearly	66.2	62.6	100	21	69.8	66.2	104	23	68.0	64.4	106	25

# Some months missing

## TEMPERATURE, HUMIDITY, AND WIND

## TEMPERATURE - DEGREES IN FAHRENHEIT

## IN MEXICO

Month	Villa Hidalgo, Coahuila				Nuevo Laredo, Tamps., C.I.L.A.				Nueva Cd. Guerrero, Tamaulipas			
	Mean 1987	# Average August 1951-1987	1987		Mean 1987	# Average August 1964-1987	1987		Mean 1987	# Average 1958-1987	1987	
			Max.	Min.			Max.	Min.			Max.	Min.
Jan.	50.0	53.6	77	32	55.4	59.0	81	32	55.4	57.2	84	32
Feb.	53.6	59.0	79	32	60.8	62.6	82	37	60.8	62.6	86	41
Mar.	57.2	64.4	81	25	64.4	69.8	88	34	64.4	68.0	86	34
Apr.	64.4	71.6	99	32	71.6	77.0	104	36	69.8	77.0	100	43
May	75.2	78.8	93	57	80.6	82.4	99	63	80.6	82.4	95	63
June	78.8	84.2	100	61	84.2	87.8	100	66	84.2	86.0	100	66
July	82.4	86.0	100	64	86.0	89.6	104	72	86.0	87.8	102	70
Aug.	84.2	86.0	102	66	89.6	89.6	102	72	87.8	87.8	104	72
Sept.	78.8	80.6	99	52	84.2	84.2	99	64	82.4	82.4	102	61
Oct.	69.8	71.6	93	48	75.2	75.2	90	59	77.0	73.4	100	59
Nov.	60.8	62.6	86	27	64.4	68.0	100	39	68.0	66.2	91	43
Dec.	53.6	55.4	88	32	59.0	60.8	81	34	60.8	60.8	91	34
Yearly	68.0	71.6	102	25	73.4	75.2	104	32	73.4	68.0	104	32

Month	Cd. Mier, Tamaulipas				Retamal, Tamaulipas							
	Mean 1987	# Average October 1955-1987	1987		Mean 1987	# Average 1951-198	1987					
			Max.	Min.			Max.	Min.				
Jan.	57.2	57.2	84	30	60.8	60.8	86	34				
Feb.	62.6	60.6	88	43	66.2	62.6	90	43				
Mar.	64.4	68.0	88	32	66.2	68.0	95	34				
Apr.	69.8	75.2	104	39	71.6	75.2	100	36				
May	80.6	80.6	100	64	82.4	80.6	100	64				
June	86.0	84.2	106	70	86.0	82.4	104	70				
July	89.6	87.8	106	72	87.8	86.0	104	72				
Aug.	89.6	87.8	108	72	89.6	86.0	104	75				
Sept.	84.2	82.4	104	59	87.8	82.4	106	63				
Oct.	77.0	73.4	97	57	78.8	75.2	99	61				
Nov.	68.0	64.4	93	36	69.8	68.0	99	45				
Dec.	----	----	---	---	68.0	62.6	97	41				
Yearly	----	----	---	---	77.0	69.8	106	34				

# Some months missing

## TEMPERATURE, HUMIDITY, AND WIND

## MEAN WIND SPEED - MILES PER HOUR

## IN THE UNITED STATES

Month	Martin King Ranch, Texas		Amistad Dam, Texas		Eagle Pass, Texas		Falcon Dam, Texas	
	1987	Average 1957-1987	1987	# Average March 1963-1987	1987	# Average December 1963-1987	1987	# Average July 1950-1987
Jan.	3.6	3.8	2.2	3.0	1.9	2.8	2.7	3.5
Feb.	4.6	4.5	3.0	3.5	2.9	3.3	3.6	4.1
Mar.	6.0	5.9	1.9	4.2	2.8	3.8	3.2	4.6
Apr.	6.5	6.2	2.6	4.3	3.9	4.0	1.7	5.1
May	6.5	6.6	2.5	4.2	2.7	3.9	3.7	4.9
June	13.9	7.3	2.5	4.5	3.0	3.8	2.7	5.4
July	13.4	6.8	3.5	4.2	3.8	3.9	1.7	5.6
Aug.	13.4	6.2	3.2	3.8	3.4	3.6	2.9	4.9
Sept.	2.9	5.1	2.5	3.4	2.1	3.1	2.2	3.8
Oct.	4.8	4.7	2.6	3.2	2.4	2.6	2.1	3.3
Nov.	3.5	4.0	3.0	3.0	3.4	2.5	2.4	3.5
Dec.	3.2	3.5	2.7	2.9	3.3	2.4	1.8	3.3
Yearly	6.9	5.4	2.7	3.7	3.0	3.3	2.6	4.3

## MEAN RELATIVE HUMIDITY - PERCENT

## IN THE UNITED STATES

Month	Amistad Dam, Texas		Eagle Pass, Texas		Falcon Dam, Texas	
	1987	Average March 1963-1987	1987	# Average 1964-1987	1987	# Average July 1950-1987
Jan.	55.1	62.7	55.1	63.8	57.8	67.7
Feb.	60.8	60.1	----	60.4	66.4	65.2
Mar.	56.1	55.0	----	57.0	64.0	62.9
Apr.	53.6	57.7	----	59.1	55.7	62.7
May	73.2	64.9	----	65.6	73.6	66.4
June	74.4	64.3	----	64.4	75.5	65.2
July	65.2	60.1	----	59.5	68.2	61.8
Aug.	48.8	60.4	----	61.2	64.4	62.5
Sept.	51.5	65.4	----	66.9	64.5	66.8
Oct.	44.7	65.8	----	67.9	62.9	67.0
Nov.	49.4	63.8	59.5	67.3	63.6	67.2
Dec.	48.1	62.7	95.1	67.1	63.7	67.4
Yearly	56.7	61.9	----	63.3	65.0	65.2

# Some months missing

**DRAINAGE BASIN AND IRRIGATED AREAS  
ALONG THE RIO GRANDE AND TRIBUTARIES - 1987**

The total area within the outer rim of the Rio Grande basin is about 335,500 square miles, but it contains large areas, especially along its southwestern boundary, that contribute no surface runoff to the Rio Grande. Such noncontributing areas constitute about 47 percent of the total area, leaving 176,333 square miles of productive watershed, which is the only one included in the list below.

The irrigated areas shown below are listed in accordance with the location of their diversions points and are all within the Rio Grande Basin, except in the lower Rio Grande Valley where large portions of irrigated lands in both countries lie outside the basin boundary line.

On the United States side, only the areas irrigated in 1987 are shown, except that in the reaches below Falcon Dam, the figures shown represent acreages which were subject to irrigation in 1987 but for which data on the portion actually irrigated is not known. On the Mexican side, part of the data may have been gathered previous to 1987. The irrigated area data tabulated are the best data that could be obtained.

DESIGNATION OF AREAS AND GAGING STATIONS	Drainage Basin Square Miles			Irrigated Areas - Acres		
	United States	Mexico	Total	United States	Mexico	Total
Above Elephant Butte Dam	25,923	0	25,923	0	0	0
Elephant Butte Dam to Caballo Dam	1,295	0	1,295	0	0	0
Above Caballo Dam	27,218	0	27,218	0	0	0
Caballo Dam to American Dam	2,053	0	2,053	83,531	0	83,531
Above American Dam	29,271	0	29,271	83,531	0	83,531
American Dam to Acala Station	672	544	1,216	62,471	12,849	75,320
Above Acala Gaging Station	29,943	544	30,487	146,002	12,849	158,851
Acala Station to Fort Quitman Station	663	794	1,457	18,342	0	18,342
Above Fort Quitman Gaging Station	30,606	1,338	31,944	164,344	12,849	177,193
Fort Quitman Station to Above Presidio Station	1,646	1,410	3,056	a) 25	a) 188	213
Above Presidio Station above Rio Conchos	32,252	2,748	35,000	164,369	13,037	177,406
Rio Conchos above Francisco I. Madero Dam	0	4,161	4,161	0	9,803	9,803
Rio Conchos above Boquilla Dam	0	3,970	3,970	0	32,442	32,442
Rio Conchos above Luis L. Leon Dam	0	14,861	14,861	0	56,760	56,760
Rio Conchos above mouth of river	0	3,412	3,412	0	52,048	52,048
Rio Conchos - Total	0	26,404	26,404	0	151,053	151,053
Alamito Creek above Gaging Station	1,504	0	1,504	0	0	0
Presidio Station Above Rio Conchos to Presidio Station below Rio Conchos - excluding above tributaries	340	91	431	3,222	447	3,669
Presidio Station above Rio Conchos to Presidio Station below Rio Conchos - Total	1,844	26,495	28,339	3,222	151,500	154,722
Above Presidio Station below Rio Conchos	34,096	29,243	63,339	167,591	164,537	332,128
Terlingua Creek above Gaging Station	1,070	0	1,070	0	0	0
Presidio Station below Rio Conchos to Johnson Ranch Station - excluding Terlingua Creek	1,093	2,258	3,351	676	5,026	5,702
Ranch Station - Total	2,163	2,258	4,421	676	5,026	5,702
Above Johnson Ranch Gaging Station	36,259	31,501	67,760	168,267	169,563	337,830
Johnson Ranch Station to Foster Ranch Station	6,412	6,570	12,982	55	0	55
Above Foster Ranch Gaging Station	42,671	38,071	80,742	168,322	169,563	337,885
Foster Ranch Station to Langtry Station	182	505	687	0	0	0
Above Langtry Gaging Station (Discontinued)	42,853	38,576	81,429	168,322	169,563	337,885
Pecos River above Girvin	29,562	0	29,562	9,374	0	9,374
Pecos River, Girvin to Station Near Langtry Station Near Langtry to Mouth (Discontinued)	5,617	0	5,617	1,145	0	1,145
Pecos River - Total	129	0	129	0	0	0
35,308	0	35,308	10,519	0	10,519	
Devils River above Pafford Crossing	3,961	0	3,961	0	0	0
Pafford Crossing to mouth (Discontinued)	344	0	344	0	0	0
Devils River - Total	4,305	0	4,305	0	0	0
Langtry Station to Amistad Dam - excluding above tributaries	217	1,875	2,092	0	0	0
Langtry Station to Amistad Dam - Total	39,830	1,875	41,705	10,519	0	10,519
Above Amistad Dam	82,683	40,451	123,134	178,841	169,563	348,404
Amistad Dam to Below Amistad Dam Gaging Station	5	4	9	0	0	0
Above the Below Amistad Dam Gaging Station	82,688	40,455	123,143	178,841	169,563	348,404
Below Amistad Dam Station to Del Rio Station	60	100	160	245	0	245
Above Del Rio Gaging Station	82,748	40,555	123,303	179,086	169,563	348,649
Arroyo Las Vacas above Gaging Station	0	350	350	0	600	600
San Felipe Creek above Gaging Station	46	0	46	1,630	0	1,630
Pinto Creek Above Gaging Station	249	0	249	80	0	80
Rio San Diego above Gaging Station	0	853	853	0	10,964	10,964
Rio San Diego above mouth of river	0	6	6	0	1,179	1,179
Rio San Diego - Total	0	859	859	0	12,143	12,143

DRAINAGE BASIN AND IRRIGATED AREAS  
ALONG THE RIO GRANDE AND TRIBUTARIES - 1987

DESIGNATION OF AREAS AND GAGING STATIONS	Drainage Basin Square Miles			Irrigated Areas - Acres		
	United States	Mexico	Total	United States	Mexico	Total
Del Rio Station to Jimenez Station - excluding above tributaries	669	110	779	b) 36,691	4,487	41,178
Del Rio Station to Jimenez Station - Total	964	1,319	2,283	38,401	17,230	55,631
Above the Jimenez Gaging Station	83,712	41,874	125,586	217,487	186,793	404,280
Rio San Rodrigo above Gaging Station	0	1,049	1,049	0	0	0
Rio San Rodrigo - Total	0	1,049	1,049	0	0	0
Jimenez Station to Maverick Power Plant - excluding Rio San Rodrigo	287	114	401	1,510	0	1,510
Jimenez Station to Maverick Power Plant - Total	287	1,163	1,450	1,510	0	1,510
Above Maverick Power Plant	83,999	43,037	127,036	218,997	186,793	405,790
Maverick Power Plant to Piedras Negras Station	244	32	276	160	778	938
Above Piedras Negras Gaging Station	84,243	43,069	127,312	219,157	187,571	406,728
Rio Escondido above Gaging Station	0	1,459	1,459	0	180	180
Rio Escondido - Total	0	1,471	1,471	0	180	180
Piedras Negras Station to El Indio Station - excluding Rio Escondido	237	206	443	270	652	922
Piedras Negras Station to El Indio Station - Total	237	1,677	1,914	270	832	1,102
Above El Indio Gaging Station	84,480	44,746	129,226	219,427	188,403	407,830
El Indio Station to Villa Hidalgo Station	629	1,683	2,312	1,004	2,609	3,613
Above Villa Hidalgo Gaging Station	85,109	46,429	131,538	220,431	191,012	411,443
Villa Hidalgo Station to Nuevo Laredo Station	607	433	1,040	3,179	2,520	5,699
Above Nuevo Laredo Gaging Station	85,716	46,862	132,578	223,610	193,532	417,142
Rio Salado above Venustiano Carranza Dam	0	15,831	15,831	0	10,087	10,087
Rio Salado above Las Tortillas Gaging Station	0	23,155	23,155	0	69,849	69,849
Rio Salado above River Road Crossing	0	23,323	23,323	0	69,849	69,849
Nuevo Laredo Station to Falcon Dam - excluding Rio Salado	2,042	1,327	3,369	c) 5,552	2,456	8,008
Nuevo Laredo Station to Falcon Dam - Total	2,042	24,650	26,692	5,552	72,305	77,857
Amistad Dam to Falcon Dam - excluding above tributaries	4,780	4,009	8,789	48,611	96,274	144,885
Above Falcon Dam	87,758	71,512	159,270	229,162	265,837	494,999
Rio Alamo above Gaging Station	0	1,675	1,675	0	12,625	12,625
Rio San Juan above Marte Gomez Dam	0	12,745	12,745	0	165,842	165,842
Rio San Juan - Marte Gomez Dam to Camargo Gaging Station	0	195	195	0	853	853
Rio San Juan - Total	0	12,949	12,949	0	166,695	166,695
Falcon Dam to Rio Grande City Station - excluding above tributaries	222	246	468	5,013	7,470	12,483
Falcon Dam to Rio Grande City Station - Total	222	14,870	15,092	5,013	186,790	191,803
Above Rio Grande City Gaging Station	87,980	86,382	174,362	234,175	452,627	686,802
Rio Grande City Station to Anzalduas Dam	952	798	1,750	179,657	17,367	197,024
Anzalduas Canal				0	484,692	484,692
Above Anzalduas Dam	88,932	87,180	176,112	413,832	954,686	1,368,518
Anzalduas Dam to Progreso Station	13	163	176	125,370	4,450	129,820
Above Progreso Gaging Station	88,945	87,343	176,288	539,202	959,136	1,498,338
Progreso Station to San Benito Station	7	9	16	319,610	4,238	323,848
Above San Benito Gaging Station	88,952	87,352	176,304	858,812	963,374	1,822,186
San Benito Station to Brownsville Station	14	15	29	85,076	3,336	88,412
Falcon Dam to Brownsville Station - excluding Rio Alamo and Rio San Juan	1,208	1,231	2,439	714,726	521,553	1,236,279
Above Brownsville Gaging Station	88,966	87,367	176,333	943,888	966,710	1,910,598
Brownsville Station to Gulf of Mexico				4,212	0	4,212
Falcon Dam to Gulf of Mexico - excluding Rio Alamo and Rio San Juan				718,938	521,553	1,240,491
Amistad Dam to Gulf of Mexico - excluding above tributaries				767,549	617,827	1,385,376
Above Gulf of Mexico				948,100	966,710	1,914,810

a) Total area irrigated from the Rio Grande at Least once during the year; additional irrigations from this source dependent on availability of river water in this reach.

b) Includes 36,691 acres irrigated from the Maverick Canal below Mile 13 gaging station.

c) Includes 110 acres irrigated from small reservoirs.

SUPPLEMENTARY DATA--INTERNATIONAL AMISTAD RESERVOIR  
DEDUCED INFLOWS

Considering that a knowledge of the mean daily inflows reaching the International Amistad Reservoir would serve a useful purpose, such data have been deduced for 1987 showing the flows as closely as they can be approximated. These data are based on the daily operation of the International Amistad Reservoir, taking into account: a) record of gage heights at the dam; b) releases; c) filtrations; d) elevation-area-capacity tables based on 1981 survey; and e) rate of evaporation measured at the dam.

Flow contributions from different sources, river channel losses, reservoir evaporation, accuracy of gage-height records, displacement due to wind action on the reservoir, and bank storage and return incident to changes in reservoir level, all tend to cause variations in the deduced determinations; and the inflows shown below should not necessarily be in agreement with the combined flow of the Rio Grande at Foster Ranch, Pecos River near Langtry, and Devils River at Pafford Crossing.

In spite of the deficiencies noted above and others that may occur, the data shown below represent a reasonable approximation of the flows entering the International Amistad Reservoir.

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4,960	3,650	4,440	3,230	4,590	6,700	5,220	4,660	5,410	4,910	2,870	2,200
2	5,000	3,520	4,180	3,060	4,040	9,420	4,560	4,700	5,930	2,690	2,110	
3	5,030	3,460	4,260	3,000	4,650	7,930	3,820	5,080	4,000	4,490	2,700	2,200
4	4,790	3,430	4,250	3,260	4,660	7,100	3,260	5,620	3,360	3,740	2,860	2,050
5	4,830	5,600	4,170	3,490	3,870	11,700	3,200	5,790	2,950	3,580	2,790	2,110
6	4,850	5,340	3,810	3,840	4,200	12,800	3,080	5,960	3,470	3,390	2,560	1,940
7	4,770	4,230	4,040	3,930	4,000	12,400	3,360	5,650	3,830	2,940	2,570	1,910
8	4,620	4,070	4,360	4,180	4,410	8,510	3,420	5,070	4,160	2,810	3,120	1,950
9	4,420	4,070	4,740	4,290	3,670	7,460	3,470	4,690	4,060	2,570	2,890	1,930
10	4,280	4,040	4,780	3,930	3,770	7,780	3,580	4,730	4,260	2,580	2,680	1,910
11	8,340	4,080	4,800	3,660	4,360	8,500	3,720	6,220	4,100	2,540	2,320	1,960
12	4,320	4,200	4,690	3,570	4,270	6,930	4,120	5,010	4,280	2,790	2,360	2,020
13	4,250	4,100	4,580	3,200	4,620	8,000	5,040	4,540	3,480	3,480	2,360	1,900
14	4,310	4,230	4,640	3,210	4,860	8,740	5,270	5,140	4,020	3,620	2,240	1,980
15	4,320	3,690	4,590	3,090	5,110	7,230	5,220	4,760	4,630	3,290	1,700	1,830
16	4,280	3,850	5,060	3,010	4,790	7,580	5,730	4,080	4,040	3,250	1,530	1,820
17	4,380	3,870	4,750	3,110	5,850	5,290	9,090	4,090	3,320	3,200	1,690	1,880
18	4,130	3,770	4,520	3,340	5,790	5,290	8,210	4,040	3,760	2,740	1,930	1,970
19	4,060	3,730	4,450	3,390	5,780	5,040	5,920	3,910	3,460	2,830	1,790	2,310
20	3,970	3,770	4,500	4,020	6,050	4,660	5,200	3,830	3,540	3,230	1,790	2,320
21	4,000	3,590	4,430	5,080	4,690	5,600	6,390	3,750	2,860	3,630	1,720	2,400
22	4,020	3,550	4,460	4,550	4,490	5,350	6,110	3,310	2,830	3,470	1,820	2,320
23	3,980	3,790	3,840	4,680	3,630	5,440	5,300	3,160	2,610	3,220	2,050	2,400
24	4,010	3,980	3,910	6,500	11,400	4,430	5,450	3,290	2,150	3,140	2,190	2,370
25	4,070	4,000	3,870	5,710	6,780	5,370	4,090	2,360	3,250	1,950	2,560	
26	3,900	4,010	3,920	4,570	6,240	4,360	5,980	4,690	2,490	3,690	2,240	2,380
27	3,800	4,310	3,700	4,680	5,020	3,770	6,150	6,490	2,820	3,620	2,230	2,270
28	3,920	4,230	3,750	4,760	5,040	3,620	5,860	5,640	3,110	3,470	2,240	2,250
29	3,980	3,770	3,540	5,230	4,870	5,840	5,430	7,170	4,850	3,440	2,150	1,920
30	3,770	3,690	3,270	5,760	4,500	5,650	5,030	8,400	4,520	3,140	2,230	1,880
31	3,690		3,380		5,030		4,720	8,030		2,860		1,850
<b>Sum</b>	112,160	121,330	205,860		157,590		104,840			64,900		
	133,050	131,680	155,030		156,280		109,710			68,260		

Current Year 1987

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	Day			Average	Maximum	Minimum
				High	Low				
Jan.			3	5,030	31	3,690	4,290	263,466	72,708
Feb.		5	5,600	4	3,430	4,010	222,466	73,688	
Mar.		16	5,060	30	3,270	4,250	261,183	150,792	304,417
Apr.		24	6,500	3	3,000	4,040	240,654	162,788	354,458
May		24	11,400	23	3,630	5,000	307,497	193,130	307,497
June		6	12,800	28	3,620	6,860	408,317	207,044	418,612
July		17	9,090	6	3,080	5,040	309,977	216,378	689,085
Aug.		30	8,400	23	3,160	5,080	312,575	246,951	86,995
Sept.		1	5,410	24	2,150	3,660	217,606	368,369	2,091,428
Oct.		2	5,930	11	2,540	3,380	207,947	324,906	950,737
Nov.		8	3,120	16	1,530	2,280	135,392	152,827	454,512
Dec.		25	2,560	16	1,820	2,090	128,727	120,109	260,410
			12,800		1,530	4,170	3,016,242	2,377,435	4,328,998
Yearly	Meters			Cubic Meters per Second			Thousands of Cubic Meters		
				362	43.3	118	3,720,474	2,932,519	5,339,732

0 Mean daily

08-4611.00 SUPPLEMENTARY DATA - INTERNATIONAL FALCON RÉSERVOIR  
DEDUCED INFLOWS

Considering that a knowledge of the mean daily inflows reaching the International Falcon Reservoir would serve a useful purpose, such data have been deduced for 1987 showing the flows as closely as they can be approximated. These data are based on the daily operation of the International Falcon Reservoir, taking into account: a) record of gage heights at the dam; b) releases as measured at both hydroelectric plants and outlet works; c) elevation-area-capacity tables based on 1971-1972 surveys; and d) rate of evaporation measured at the dam and Nueva Cd. Guerrero applied to an area one foot higher than the average area of two consecutive days.

Flow contributions from different sources, irrigation diversion between Laredo and Falcon, river channel losses, reservoir evaporation, accuracy of gage-height records, displacement due to wind action on the reservoir, and bank storage and return incident to changes in reservoir level, all tend to cause variations in the deduced determinations; and the inflows shown below should not necessarily be in agreement with the combined flow of the Rio Grande at Laredo and the Rio Salado at Las Tortillas.

In spite of the deficiencies noted above and others that may occur, the data shown below represent a reasonable approximation of the flows entering the International Falcon Reservoir.

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4,270	5,370	4,590	4,270	2,550	6,710	6,000	6,710	10,800	3,170	2,290	445
2	4,170	5,690	3,920	4,100	2,520	6,710	7,350	6,430	8,720	2,740	1,930	989
3	5,330	5,190	3,990	3,990	3,000	10,900	6,780	5,160	9,460	3,110	2,590	1,900
4	3,390	5,160	4,060	3,600	5,720	8,120	5,720	4,590	9,250	2,900	2,440	1,170
5	2,960	6,000	4,310	3,990	5,330	6,890	5,790	8,020	6,290	6,670	2,770	1,950
6	2,840	5,510	4,380	5,260	5,090	7,380	7,590	5,440	7,880	3,990	2,140	1,660
7	3,230	5,540	4,450	3,050	3,200	24,700	6,850	6,500	6,920	3,190	2,600	1,100
8	3,210	5,580	4,980	3,080	3,050	16,000	7,730	6,570	6,460	3,670	6,890	925
9	3,130	5,010	4,310	3,080	1,540	14,800	4,130	5,690	4,240	3,050	2,910	703
10	3,160	3,640	4,310	2,420	2,710	12,500	3,990	5,260	8,550	3,670	1,650	1,140
11	2,700	4,730	6,070	3,320	7,060	10,600	3,810	5,840	7,310	3,780	1,530	1,540
12	2,740	4,660	4,060	2,550	5,860	10,500	3,780	5,760	7,380	3,640	1,800	1,880
13	2,650	4,520	3,810	2,620	3,470	11,400	3,920	4,480	6,000	2,910	1,510	904
14	2,170	4,590	3,530	1,900	4,730	12,200	3,990	5,260	5,900	3,880	2,080	1,690
15	3,270	5,120	3,920	3,120	2,670	10,600	2,710	5,790	6,460	3,880	2,180	1,270
16	2,830	5,300	4,700	2,690	2,970	9,750	3,370	5,760	5,690	3,810	4,270	802
17	3,430	3,810	4,630	2,800	3,280	8,050	4,590	5,470	4,910	3,670	2,720	1,010
18	3,340	3,810	4,240	2,820	2,890	7,700	5,260	5,510	5,760	3,810	3,600	703
19	4,910	4,730	3,570	1,850	2,720	6,920	7,910	4,730	4,240	4,130	2,930	2,120
20	5,470	3,880	4,450	1,880	2,910	9,040	6,070	4,800	3,600	4,840	2,990	1,160
21	5,090	2,860	4,030	2,600	3,110	8,440	6,820	4,100	5,050	3,330	2,760	982
22	4,310	2,950	4,060	2,700	3,420	5,720	6,250	5,540	3,960	3,280	1,800	904
23	3,850	5,400	3,960	2,940	2,310	8,260	8,090	5,690	3,400	2,480	1,830	795
24	4,840	4,030	3,100	2,590	7,270	8,090	7,380	5,010	2,770	3,090	1,290	784
25	5,830	5,620	3,430	2,640	3,270	8,050	10,600	4,660	2,620	2,720	1,510	1,920
26	6,360	6,070	4,170	2,540	2,960	7,910	8,480	3,990	3,150	3,270	1,620	1,800
27	5,470	4,660	3,100	2,540	2,960	7,030	6,460	3,920	2,510	2,440	1,270	1,890
28	5,720	4,630	2,990	2,540	4,450	6,960	8,020	4,410	3,390	1,840	1,270	1,680
29	5,440	3,880	2,470	4,910	6,820	6,500	6,780	3,320	2,600	1,500	893	
30	5,690	5,120	2,790	3,400	8,160	5,400	11,700	3,250	2,450	1,870	2,080	2,660
31	5,580	4,100		5,090			6,780	15,400		3,020		
<b>Sum</b>	<b>134,060</b>			<b>88,740</b>		<b>286,910</b>		<b>184,570</b>		<b>105,030</b>		<b>41,449</b>
	127,380			128,220		116,420		188,120		169,240		70,640

Current Year 1987

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Period 1968-1987			
	High	Low	Day	High	Low			Average	Maximum	Minimum	
Jan.			26	6,360	14	2,170	4,100	252,619	136,353	252,619	
Feb.			26	6,070	21	2,860	4,800	265,927	161,659	453,053	
Mar.			11	6,070	28	2,990	4,130	254,299	175,602	431,073	
Apr.			6	5,260	19	1,850	2,960	176,024	181,585	576,717	
May			24	7,270	9	1,540	3,740	230,911	323,122	768,748	
June			7	24,700	22	5,720	9,570	569,049	304,124	770,709	
July			25	10,600	15	2,710	6,070	373,209	286,545	1,056,340	
Aug.			31	15,400	27	3,920	5,970	366,127	256,477	33,481	
Sept.			1	10,800	27	2,510	5,650	335,777	371,738	1,442,682	
Oct.			5	6,670	28	1,840	3,390	208,371	326,143	1,365,884	
Nov.			8	6,390	127	1,270	2,360	140,091	168,811	538,929	
Dec.			31	2,660	1	445	1,340	82,219	136,845	304,865	42,870
Yearly				24,700		445	4,520	3,254,623	2,829,004	6,234,950	1,280,067
	<b>Meters</b>			<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>				
				700		12.6	128	4,014,534	3,170,394	7,690,727	1,578,946

Mean daily

And other days